

National Chiao Tung University Department of Mechanical Engineering Doctoral Program Regulations

Approved by department faculty meeting, June 21, 1995
Amended and approved by department faculty meeting, November 13, 2002
Amended and approved by department faculty meeting, November 12, 2003
Amended and approved by department faculty meeting, October 13, 2004
Amended and approved by department faculty meeting, February 23, 2005
Amended and approved by department faculty meeting, March 15, 2006
Amended and approved by department faculty meeting, April 11, 2007
Amended and approved by department faculty meeting, December 12, 2007
Amended and approved by department faculty meeting, January 2, 2008
Amended and approved by department faculty meeting, March 18, 2009
Amended and approved by department faculty meeting, October 14, 2009
Amended and approved by department faculty meeting, March 10, 2010
Amended and approved by department faculty meeting, October 13, 2010
Amended and approved by department faculty meeting, April 13, 2011
Amended and approved by department faculty meeting, June 15, 2011
Amended and approved by department faculty meeting, September 21, 2011
Amended and approved by department faculty meeting, January 11, 2012
Amended and approved by department faculty meeting, February 29, 2012
Amended and approved by department faculty meeting, February 27, 2013
Amended and approved by department faculty meeting, September 25, 2013
Amended and approved by department faculty meeting, November 13, 2013
Amended and approved by department faculty meeting, September 24, 2014
Amended and approved by department faculty meeting, March 18, 2015
Amended and approved by Department faculty meeting, September 23, 2015

I. Legal Foundation:

These graduations regulations for doctoral degree candidates (hereafter referred to as "doctoral students") of National Chiao Tung University (hereafter referred to as "the University") Department of Mechanical Engineering (hereafter referred to "the Department") are formulated in compliance with the National Chiao Tung University Regulations for Master and Doctoral Degrees Conferment.

II. Admissions Channel:

Admission channels for the Department's doctoral degree are:

- (1) Recruitment and testing: Applications are open to those who have fulfilled one of the following requirements. Admission into the Department's doctoral program (including employed students) will be based on the University's open recruitment and testing:
 1. Masters degree qualification (including students graduating from a masters program and equivalent).
 2. Bachelor of Medicine qualification.
- (2) Masters to Doctoral Program: Admission into the Department's doctoral program is based on the Department's Masters to Doctoral program regulations

- (3) Dual Degree: For doctoral students enrolled in the department's Doctorate Program through the Dual Degree Program policies of this university and other universities.
- (4) Others: Admission into the Department's doctoral program is based on the University's regulations for recruiting doctoral students.

III. Change of Status:

- (1) General student status applying for employed student status must fulfill the following requirements:
 1. Been in the program for two or more years or passed a requirement exam.
 2. Currently employed: Submit proof of employment from the company or agency (must specify date of employment) and proof of income for the following year to the Department for verification.
 3. Return graduate scholarship received during time of employment.
- (2) Employed student status applying for general student status must fulfill the following requirements:
 1. Been in the program for one semester or more.
 2. Resignation or leave without pay from last place of employment: Submit proof from last place of employment.
- (3) Doctoral student applying for change in general or employed student status must submit application for status change, and upon approval by advisor, submit to the Department faculty meeting for approval, and obtain the approval and signature of the dean. Change in status is permitted only once.

IV. Transfer From Other Departments or Groups:

- (1) The Department does not accept transfer doctoral students from other institutes, departments or groups.
- (2) Doctoral students in the Department are not permitted to transfer to other groups.

V. Time to Degree:

- (1) The Department doctoral students must complete their program in not less than two years and not more than seven years. Employed students are allowed a one-year extension.
- (2) The above time limitation for program completion does not include leave of absence. Doctoral students are allowed one semester, one academic year or two academic years of leave of absence, but accumulated absence must not exceed two academic years.
- (3) Upon deadline for time to degree, doctoral students who have not fulfilled graduation requirements must drop out.
- (4) Masters to Doctoral Program students who fail to pass their doctoral exam, but who fulfill masters program requirements will be conferred masters degree subject to decision by the doctoral Exam Committee.

VI. Graduation Requirements:

- (1) To graduate, the Department's doctoral students must fulfill the following requirements:
 1. Graduation credits:
 - (1) Completed at least 18 credits of graduate courses; Masters to Doctoral program students must complete at least 36 credits of graduate courses (including masters level credits and the transferred and waived credits from Bachelor to Doctoral program).
 - (2) Except for dual degree program students, Bachelor to Doctoral program students with approved transferred and waived credits and doctoral students who failed to graduate and re-tested into the program, credit requirement for graduation does not include English Language Study courses, credit transfer or course waiver.
 2. Completed at least 4 semesters of Seminar Discussion courses.
 3. Passed the Department's Regulations for Doctoral Student English Competency Evaluation.
 4. Passed the doctoral candidacy exam.
 5. Fulfilled thesis presentation requirements.
 6. Made at least one presentation in the Department's Seminar Discussion course.
 7. Passed the doctoral Degree Exam, and submitted the Oral Defense Committee Report.
- (2) A score of less than 70 for doctoral students is a failing grade, and no credit will be awarded for that course. However, other eligibility criteria are used in Course Exams.
- (3) Credits, course and other relevant requirements for graduation are based on the graduation regulations for the year of admission into the doctoral program. Please refer any questions to the Teaching and Curriculum Committee.

VII. Advisor:

- (1) Doctoral students in the Department must confirm their choice of advisor within 2 weeks after the beginning of the first semester, and submit a proof of confirmation signed by the advisor to the Department for records. If an advisor cannot be confirmed by the deadline, an extension is allowed until before the second semester. If a student cannot confirm an advisor after the extension, the Teaching and Curriculum Committee will handle the matter.
- (2) Advisors must be full-time or adjunct instructors in the Department. However, if the advisor is an adjunct instructor, another full-time instructor from the Department must act as the joint advisor.
- (3) For joint advising, a joint advisor agreement for the proposed thesis must be submitted for approval by the current advisor, joint advisor and Teaching and Curriculum Committee, and sent to the Department for records before the oral defense.
- (4) Changing advisor:

1. Approval must be obtained from the current advisor, the new advisor and the Department Chair. Only one change in advisor is permitted.
2. The original thesis is valid only after approval by the original advisor and the new advisor.
3. Except for the original advisor resigning or retiring, thesis presentation must be delayed for at least a year after a change in advisor, and a thesis proposal must be re-submitted.
4. Any dispute will be referred to the Teaching and Curriculum Committee, and settled by the Department faculty meeting.

VIII. Credit Transfer and Course Waiver:

- (1) Department doctoral students who have already passed the Course Exam for their group (including students who have taken elective courses in the Department prior to admission) must apply for course waiver within the first month of the first semester subject to approval by the advisor and the joint approval of instructors who have previously taught the course. Waived courses do not count toward graduation credits, and must be substituted with other courses to make up for graduation credits. The alternative courses must be designated by the advisor.
- (2) Dual degree program students and doctoral students who failed to graduate and re-tested into the program may apply for credit transfer or course waiver for credits taken (including English courses and Seminar Discussion course). Upon approval by their advisor, the course instructor and Teaching and Curriculum Committee, the credits are counted toward graduation credits. However, a thesis proposal must be re-submitted and presented in the Seminar Discussion course. In addition, thesis presented prior to admission (including between semesters) must be approved by the previous advisor and the new advisor before it can be counted.
- (3) Credit transfer limit for dual degree programs is based on the university's dual degree policies.
- (4) Bachelor to Doctoral program students can apply for credit transfer or course waiver through the application process for graduate students. A maximum of 24 credits can be transferred and waived.

XI. Eligibility for Doctoral Candidacy:

- (1) There are two eligibility exams for students admitted based on masters qualification (including Masters to Doctoral program and other admissions channels:

1. Basic Course Competency Exam:

- (1) Exam Criteria: Heat and Transfer Group and Solid Mechanics and Control Group, 70 points; Design and Fabrication Group, 80 points, 75 for the Group of Micro/Nano.
- (2) Exam Courses:
 - A. Heat and Transfer Group:

(A)Both Advanced Applied Math and Viscous Hydrodynamics are required courses.

(B)Choose one of the following five courses: Heat Convection, Heat Conduction and Thermal Radiation, Introduction to Turbulent Flow, Micro and Nano Energy Transport, Combustion Fundamentals.

(C)Choose at least one graduate professional course offered by instructors outside the group.

B. Solid Mechanics and Control Group:

(A)All three courses-Theory of Elasticity, Advanced Dynamics and Finite Unit (Element) Method are required, or all three courses- Linear Systems, Advanced Dynamics and Digital Control System, are required.

(B)Choose at least one graduate professional course offered by instructors outside the group.

C. Design and Fabrication Group:

(A)Choose at least three of the following courses: Best Designs, Applied Biomechanics, Robotics, Applied Plastic Mechanics, Engineering Rheology, Electromechanical Systems Design and Practice, Engineering Design, Human Neuromechanics, Microelectromechanical Fabrication Lab, Intelligence Material and Nano and Micro Components.

(B)Choose at least one graduate professional course offered by instructors outside the group.

D. Group of Micro/Nano:

"Introduction to Micro/Nano Engineering" is a required Course. Among the courses of "Micro Fabrication Laboratory," "Micro/Nano scale Energy Transport," "Smart Materials and Intelligent Micro/Nano Devices," "Biosensors," "Biochip and Chip Based Diagnosis" and "Biofluid Mechanics," at least two courses must be selected.

(3)If exam courses are no longer available due to courses being canceled, no longer offered or name changed, students may use other exam courses newly offered in their group as recommended by their advisor and upon approval by the Teaching and Curriculum Committee.

2. Thesis Proposal:

(1)Upon passing the basic course competency exam, doctoral students must submit their thesis proposal within 4 years of admission (excluding leave of absence and approved absence for overseas study). In addition, the advisor must convene the first committee meeting to assist in the advising. For those failing the thesis proposal, only one more proposal may be re-submitted within 5

years of admission. Those who fail to pass their thesis proposal within the given time to degree must drop out.

- (2) The committee must comprise at least 3 members (including the advisor), with the advisor as the convener.
 - (3) The committee must provide recommendations to the advisor and doctoral student concerning the student's learning and thesis proposal.
 - (4) Within one month of passing their thesis proposal defense, doctoral students must submit their transcripts and doctoral candidacy eligibility exam form to the Department for records.
- (2) There are two eligibility exams for students admitted based on Bachelor of Medicine qualification (including Masters to Doctoral program and other admissions channels):
3. Basic Course Competency Exam: Based on the research topic, the advisor will designate 4 graduate courses. The criterion is 70 points.
 4. **Thesis Proposal: Same for students admitted on masters qualification.**

X. Doctoral Candidates:

Those who fulfill the following requirements are eligible for the Department's doctoral candidacy:

- (1) Completed required doctoral courses and fulfilled required graduation credits.
- (2) Completed 2 years of the program (employed students must complete 3 years of the program, and Masters to Doctoral Program students must complete 3 years of the program including masters courses).
- (3) Passed the doctoral candidacy eligibility exam.

XI. Thesis Presentation:

- (1) The Department's doctoral students must present their thesis, and their paper must fulfill the following requirements:
 1. Those admitted on masters qualifications (including those admitted through Masters to Doctoral Program and other channels): must published at least 2 papers in EI or SCI journals (including acceptance), and the student must be the first student author. In addition, at least one of the papers must be published in a SCI journal.
 2. Those admitted on Bachelor of Medicine qualification must fulfill one of the following two requirements:
 - (1) At least 3 papers must already be accepted by an international academic journal that has a review policy and a SCI Thesis Impact Factor of 4.0 or more. In addition, the student must be the first author in at least one of the papers.
 - (2) Published 2 SSCI theses as the first student author.
- (2) To be qualified, the thesis published in journals by the Department's doctoral students must fulfill the following requirement:
 1. The advisor must be listed as the co-author.

2. The University and Department must be listed.
3. The thesis content must be completed by doctoral students during their candidacy.

XII. Seminar Discussion Report:

- (1) Doctoral students must complete at least one report in the Seminar Discussion Course prior to applying for evaluation by the Department faculty meeting.
- (2) Within one month of completing their Seminar Discussion report, students must submit proof of their Seminar Discussion report to the Department for records.

XIII. Open Thesis Presentation:

- (1) Doctoral students who have passed their doctoral candidacy eligibility exam and fulfilled thesis presentation requirements must organize an open doctoral thesis presentation no earlier than 8 months after their thesis proposal, and invite instructors from their group to attend. To qualify, more than half the instructors from the entire group must approve.
- (2) Within one month after passing their open doctoral thesis presentation, students must submit their presentation report to the Department for records.

XIV. Department Faculty Meeting Review:

- (1) Doctoral students who have passed their open doctoral thesis presentation must submit the following documents to the Department faculty meeting for review subject to advisor recommendation:
 1. Transcripts (Including proof of English competency evaluation).
 2. Doctoral candidacy eligibility exam form.
 3. Thesis publication list and published thesis.
 4. Proof of Seminar Discussion report.
 5. Thesis open presentation report.
 6. Initial draft of doctoral thesis.
- (2) Doctoral students must fulfill the following requirements to apply for Department faculty meeting review:
 1. Completed required graduation credits and Seminar Discussion courses.
 2. Passed English competency exam.
 3. Passed doctoral candidacy eligibility exam.
 4. Fulfilled thesis publication requirements.
 5. Completed at least one report for Seminar Discussion courses.
 6. Passed the open doctoral thesis presentation.

XV. Degree Exam Committee Members:

- (1) The Department's doctoral Degree Exam Committee comprises 5-9 members from the Department's University and non-University experts whose area of specialty corresponds to the student thesis. The committee members must have the following qualifications and be recommended for appointment by the University president. At least one-third of the committee members must be from the University and non-University, respectively. The president will

appoint a committee member as convener, but the advisor cannot be the convener:

1. had previously served as professor.
 2. a member of the Academia Sinica or had previously been a researcher at the Academia Sinica ◦
 3. was previously an associate professor or associate researcher at the Academia Sinica, and attained academic achievements.
 4. has a doctoral degree, academic achievement, or assistant professorship.
 5. has qualification in a rare or unique field, and attained academic or professional achievements.
- (2) Qualification for items 3-5 are determined by the Academic Committee.
- (3) Spouse of doctoral students, blood relatives thrice removed or by marriage are not permitted to serve on the doctoral Degree Exam Committee.

XVI. Degree Exam:

- (1) Doctoral students may apply for the doctoral candidacy degree exam upon approval by the Department faculty meeting. Recommendation letter for the doctoral thesis oral exam must be submitted to the Department two weeks before the Degree Exam. The test is conducted by Exam Committee Members recommended to and appointed by the University president.
- (2) The Degree Exam for the Department's doctoral candidates include thesis exam and thesis review:
 1. Thesis exam:
 - (1) Conducted orally, with written test when necessary.
 - (2) In principle, the oral defense is opened to the public. The date, time, place and thesis topic must be announced at least one week before the defense.
 - (3) Initial draft for the thesis must be submitted to the Exam Committee for review at least 7 days before the oral defense, and one copy must be available in the professor's lounge for viewing.
 - (4) At least 5 Degree Exam Committee members must be physically present (including advisor) for the exam to proceed, and no representative is permitted.
 - (5) The Exam Committee must clearly state the direction and key areas for the student to make necessary corrections to the thesis.
 - (6) The total score for the Degree Exam is 100, and 70 is the passing grade. There is only one evaluation, the final score being the average of the scores given by the committee members. However, if more than one-third of the committee members present give a failing grade, then the final score is a failing grade, and an average score will not be taken.
 - (7) If the Degree Exam Committee determines any acts such as plagiarism or cheating in the thesis, a failing grade is given. If such

an act is discovered and proven after the degree is conferred, the degree will be revoked and the diploma recovered.

- (8) On the same day that the Department doctoral students complete their thesis exam, they must submit their Degree Exam result form, oral defense report from each committee member present and a list of oral defense fees to the Department.

2. Thesis Review:

- (1) Upon passing their thesis exam, the Department's doctoral students must make the necessary corrections as indicated by the Degree Exam Committee and return the corrected thesis to each committee member for review.
 - (2) The thesis review will not be graded; however, to pass, it must be approved by at least two-thirds of the Exam Committee.
 - (3) The passing score obtained for the thesis is the Degree Exam score, and Exam Committee members present at the exam will sign the Thesis Oral Defense Committee Review Report.
- (3) Doctoral students must complete the following within a month of passing their thesis exam and review:
 1. Submit the Thesis Oral Defense Committee Review Report to the Department.
 2. Upload a digital version of their thesis abstract and full-text to the National Chiao Tung University Dissertations and Theses Upload System according to National Chiao Tung University Library Dissertation Abstracts and Full-text Digital File Archiving Standard, and after review and approval by the library, print hard copies of the thesis.
 - (4) In principle, the Department's doctoral theses (including abstract) are written in Chinese or English, and must comply with the National Chiao Tung University Thesis Formatting Requirements.
 - (5) Except for students approved by the Center for Teacher Education to continue taking educational courses, those who have passed their thesis exam and approved in their thesis review must submit their thesis grade and a copy of their Thesis Oral Defense Committee Review Report for records at the Office of Academic Affairs Registrar Division within the week.

XVII Graduation:

- (1) The Department will recommend doctoral students who have passed their doctoral Degree Exam, fulfilled doctoral graduation requirements and submitted their Thesis Oral Defense Committee Review Report to the University for conferment of doctoral degree.
- (2) Following review and approval by the library, doctoral students must log in to the graduation system in the University's Office of Academic Affairs Registrar Division and print out the graduation procedure form, have it signed by the advisor, and submit it to the Department together with the following documents:

1. Thesis digital file approval notice from the library.
 2. Two hard copies of the thesis (a blue hardcover copy and a green paperback cover copy): one copy will be shelved at the University library, and the other copy will be collected by the Office of Academic Affairs and sent to a Ministry of Education designated archive.
 3. Thesis full text digital CD: The Department will keep the full-text CD version of thesis.
 4. Other documents required by the University or Department.
- (3) The Department defines the semester of doctoral graduation as the semester in which the student submitted the thesis exam grade and Thesis Oral Defense Committee Review Report.
 - (4) Department doctoral students who passed their thesis exam before January 31 or July 31, but are unable to complete their thesis review and submit their Thesis Oral Defense Committee Review Report by the second week of the following semester must register for that semester.
 - (5) Department doctoral students who have passed their thesis review and submitted their Thesis Oral Defense Committee Review Report, but have not completed their graduation procedure by the following semester are regarded as having graduated.
 - (6) Students who fail to submit their Thesis Oral Defense Committee Review Report within the required time to degree are regarded as having failed their Degree Exam and will be dropped out.

XVIII. Regulations Amendments:

- (1) Matters not noted in these regulations will be dealt with according to relevant statutes and regulations of the Ministry of Education and the University. Any questions will be referred to the Teaching and Curriculum Committee, or decided by the Department faculty meeting.
- (2) These regulations are established by the Department faculty meetings, and implemented following review and approval by college and University curriculum committees and subsequent approval by the Academic Affairs meeting; and likewise for amendments.