

Requirements for NTHU Physics Doctoral Degree

Amendment on February 27, 2019

1. The duration for the completion of the doctoral degree is no less than two academic years and no more than seven academic years. It is required for students to advance to PhD candidates before the end of the 4th academic year. Otherwise, students will be terminated from the doctoral program.
2. Course requirements: (1) List of required courses, (2) Credits requirement.

(1) Required courses are:

Statistical Mechanics I [5210] (3 credits)

Electrodynamics I & II [5310,5320] (3+3 credits)

Quantum Mechanics I & II [5410, 5420] (3 + 3 credits)

Colloquium I & II [5930, 5940] (1 + 1 credits)

Dissertation (0 credit)

Academic Research Ethics Education Course (0 credit)

Students can apply for a course credit waiver to the curriculum committee if the abovementioned courses have already been taken at NTHU or other institutes before enrollment. Students are required to take the Colloquiums I & II which cannot be waived.

Students have to take no less than two "Seminar" courses.

- (2) Students who have received a Master degree before enrollment must take a minimum of 18 course credits. Students enrolled with no Master degree must take a minimum of 30 course credits. Course credits which can be counted toward graduation are limited to those offered by either Physics Department or Institute of Astronomy with course number starting with "4" and above (i.e., PHYS4XXXXX, ASTR4XXXXX, PHYS5XXXXX, ASTR5XXXXX, etc), and those research-related courses offered by other graduate institutes with course number starting with "5" and above. Application for Course/Credits/Prerequisite waiver

will be reviewed by the curriculum committee.

(3) Students who take more than one course (thesis excluded) and fail all courses for two consecutive semesters will be terminated from the doctoral program.

3. Requirement for language proficiency: Students are required to show proof of English proficiency before graduation through one of the following means:

(1) To pass the English proficiency test held by NTHU, including both writing and listening comprehension tests.

(2) TOEFL with test score over 550 (paper based) or 213 (computer based) or 75 (Internet based), or TOEIC with test score over 750, or IELTS score over 6.0 for each test section. The Exam has to be taken during the PhD program or within two years before the enrollment date.

(3) To Pass the General English Proficiency Test at High-Intermediate level.

(4) To take course offered by the department of Foreign Languages (FL). Note that six course credits are required and with minimum passing score of 70 for each course.

4. PhD Candidacy: Students can advance to PhD candidates after fulfilling one of the following requirements within first three academic years, AND passing dissertation proposal (detailed below) by the end of the 4th academic year:

(1) To pass the qualifying exam: The qualifying exam is a two-day exam that is taken place in the first weekend of each semester. "Physics A" exam includes Classical Mechanics and Statistical Mechanics starting from 8:30 AM to 12:30 PM on Saturday. "Physics B" exam includes Electrodynamics, Quantum Mechanics starting from 8:30 AM to 12:30 PM on Sunday. About half of the exam questions are from past exams. Students must pass the qualifying exam within first three academic years.

- (2) To demonstrate academic excellence through course work: Students may waive part of (or all) the abovementioned qualifying exam by taking corresponding courses with a grade above “A-“ and a top 30% ranking in that course. To waive qualifying exam for Electrodynamics, Classical Mechanics, and Statistical Mechanics, students are only required to show academic excellence in Classical Electrodynamics I, Classical Mechanics I, and Statistical Mechanics I, respectively. However, to waive qualifying exam for Quantum Mechanics, students are required to show academic excellence in both Quantum Mechanics I and II. The application of qualifying exam waiver will be reviewed by the Curriculum Committee.
- (3) To publish a research paper as the main author with the PhD advisor by the end of the 3rd academic year in physics-related journals. The determination of the main authorship is by the PhD advisor. If any controversies, the dissertation committee will make a decision. The curriculum committee preserves the right to review the decision for further dispute.

Dissertation proposal: After passing one of the three requirements listed above, students can then submit a dissertation proposal to the dissertation committee before the end of the 3rd academic year and make an oral presentation. In principle, students should identify their research advisor by the end of the 1st year. And the advisor as the chair will form a dissertation committee consisting of at least three professors (assistant professors or above) from NTHU Physics department and at least one scholar/professor in the related field outside the department. Students have to pass the dissertation proposal in order to advance to PhD candidates before the end of the 4th academic year. Otherwise, students will be terminated from the doctoral program. Application for extension of the abovementioned deadlines due to unexpected circumstances will be reviewed by the curriculum committee.

Duties of the dissertation committee as follows:

1. provide guidance in the topic of the dissertation, and in the course work and research;

2. evaluate the suitability of the candidate to pursue a PhD degree;
 3. oversee the dissertation progress.
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5. Students who advance to PhD candidates by fulfilling the requirements listed in 4(a) or 4(b) have to publish at least one paper in the physics-related major journals as the main author (accepted before graduation). Students who advance to PhD candidates by fulfilling the requirements listed in 4(c) have to publish at least one other paper (a new paper) in the physics-related major journals as the main author (accepted before graduation). In addition, students have to make at least one oral presentation in physics-related conferences. The determination of the main authorship is by the PhD advisor. If any controversies, the dissertation committee will make a decision. The curriculum committee preserves the right to review the decision for further dispute.
 6. Students have to work under the supervision of the advisor for at least three semesters (18 months) before dissertation defense. For any unexpected circumstances so that students cannot meet this requirement, advisor can submit a petition to the department chair. The department chair will make a final decision after consulting with the curriculum committee.