

# **Program Requirements for the Doctoral Degree in the Graduate Institute of Science Education at the National Taiwan Normal University**

## **I. Admissions Process**

The student's admission process should be conducted in accordance with the National Taiwan Normal University (NTNU) academic regulations and requirements.

## **II. Academic Advisory Committee**

1. The student should complete forming an official academic advisory committee by the end of the first academic year.
2. The student should form an academic advisory committee that advises the student on course-related matters. The academic advisory committee is responsible for the evaluation of the student's academic course plan. If the student wishes to change the original academic course plan, the student should initiate an academic advisory committee meeting to obtain approval from the academic advisory committee before making any changes. The student should follow the most recent academic course plan to select and enroll courses.
3. Formulation of Academic Advisory Committee
  - 3.1 The student should determine the convener of the student's academic advisory committee and obtain the convener's agreement to form an official academic advisory committee.
  - 3.2 If the student still cannot determine the convener or obtain agreement from the potential convener in the second semester of the first academic year, the student will be assigned a faculty member, i.e., a professor, an associate professor, or an assistant professor, as a temporary convener through negotiation at the Institute Affairs Meeting.
  - 3.3 The temporary convener should assist the student with course-related matters for the student's first academic year.
  - 3.4 Prior to the end of the first academic year, the student should manage to form an academic advisory committee.

## **III. Designation of Faculty Advisor**

1. The student should confirm the faculty advisor prior to the end of the second academic year. If the student fails to do so, the Director of the Graduate Institute of Science Education (GISE) will communicate with the faculty in the GISE and assign an academic advisor to the student upon agreement of the faculty member. During the first academic year prior to the confirmation of faculty advisor, the student should be assisted by the Director or the assigned academic advisor with program-related matters, such as course selection.
2. The student should at least have one faculty advisor in the GISE and should turn in the "Dissertation Advisor Agreement Form" to the GISE office for future reference.

3. After the confirmation of faculty advisor, if the student wishes to request change of faculty advisor, the student should communicate with the Director and the current faculty advisor and turn in the Agreement Form for Change of Dissertation Advisor that includes both the signatures of the previous faculty advisor and the new faculty advisor. After the Agreement Form is processed, the student's change of faculty advisor will be approved.

#### IV. Course Registration and Enrollment

1. The student's registration, course selection, and enrollment should be conducted in accordance with the NTNU academic regulations and requirements.
2. The student should begin dissertation writing upon completion of the academic research ethics education online course and passing of the Practice Teaching Evaluation.
3. With consideration of the area of study of the student's master's program, the student should follow the course guidelines below to enroll required and elective courses:

Type	Area of Study of Master’s Program	Required Minimum Credit Hours					Minimum Total Credit Hours for Graduation*
		Required		Elective			
		Colloquium	Seminar	Science Education	Science	Research Method	
I	Mathematics, science, or related discipline	8	8	15	6	6	43
II	Science education	8	8	12	12	3	43
III	Other	8	8	15	12	6	49

\* At least a total of 18 credit hours obtained from doctoral and/or doctoral-master's courses.

#### 4. The Candidacy Examination

- 4.1 The student can apply for the candidacy examination after the student has enrolled in the program for one year and upon the approval of the academic advisory committee.
- 4.2 The student will become a doctoral candidate upon passing the candidacy examination.
- 4.3 The student should refer to and follow the institute's "Candidacy Examination Guidelines" to take the candidacy examination.

#### 5. Dissertation Proposal Presentation:

- 5.1 The student must pass the candidacy examination in order to apply for the preliminary examination of the "Review of Dissertation Proposal".
- 5.2 After completing the dissertation proposal, the student is required to give a presentation that is open to the public as the dissertation proposal presentation. The student should fill out the Application for Dissertation Proposal Presentation and turn in the form to the GISE office for future reference. The student should also make an extra copy for the student's own reference.
- 5.3 The student can apply for the review of dissertation proposal during a temporary leave from studies.
- 5.4 The dissertation proposal presentation should be conducted at least five months prior to the graduate

degree exam.

#### 5.5 Formulation of Dissertation Proposal Committee

5.5.1 The dissertation proposal committee should include 3 to 5 members.

5.5.2 The student's dissertation advisor must be on the committee.

5.5.3 Dissertation proposal committee members do not have to be dissertation committee members.

### 6. Publication

6.1 The student should at least have two articles published in peer-reviewed journals at the national and/or international levels. The content of the articles must be relevant to Science, Technology, Engineering, and Mathematics (STEM) education. Moreover, at least one of these articles should be published in TSSCI, SSCI, SCI, SCIE, EI, or SCOPUS journals. An accepted manuscript is considered published as long as an accepted letter from the journal is provided. Of the two aforementioned journal articles, the student should be the first author of at least one.

6.2 The student should participate in STEM education-related conferences organized by domestic or international academic organizations and complete at least two oral presentations. Of the two conference presentations mentioned above, at least one must be an oral presentation of a research paper in English (excluding poster presentations) at a conference listed in the Graduate Student Handbook, or an oral presentation at a doctoral student training activities (ex: Summer School) organized by a renowned international academic society (e.g., EASE, ESERA, NARST).

6.3 Journal articles, conference papers, and academic presentations at renowned international societies will only be counted if the student is listed as the first affiliation under the name of National Taiwan Normal University.

### 7. Teaching Experience

Prior to enrollment, if the student's science and/or mathematics work experience is less than one year, the student should accumulate relevant work experience for at least one year upon graduation.

8. Graduate Degree Exam: The student should follow the university's "Degree Conferral and Graduate Degree Exam Regulations" for the application for the graduate degree exam.

9. Upon completion of the following requirements, the student will be conferred a Doctorate of Philosophy:

9.1 The student has enrolled in the program for two years or more.

9.2 The student has completed a total of 43 or 49 credit hours based on the GISE's course guidelines.

9.3 The student has taken the academic ethics course, passed the test, and obtained the certificate.

9.4 The student has given two colloquium presentations.

- 9.5 The student has fulfilled the publication requirements.
- 9.6 The student has the work experience that is relevant to science and/or mathematics education for one year or more.
- 9.7 The student has completed the English proficiency test.
- 9.8 The student has passed the candidacy examination.
- 9.9 The student has given the dissertation proposal presentation that is open to the public.
- 9.10 The student has passed the graduate degree exam.
  
- 10. The student should refer to and follow the institute's "Program Requirements for the Doctoral Degree" based on the institute's "Graduate Student Handbook" released in the academic year when the student enrolls in the program.
  
- 11. Degree Conferral: After fulfilling the program requirements, the student graduates and receives a Doctorate of Philosophy, Ph.D.
  
- V. The Program Requirements for the Doctoral Degree was announced and began to be implemented upon the approval by the Academic Affair Committee after passed at the Institute Affairs Meeting and the Curriculum Committee Meeting of the College of Science. The approval procedure should be required if any amendments are made in the future.