

# Graduate Institute of Science Education

## Contact Information

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## Introduction

Following approval from the Ministry of Education, the Graduate Institute of Science Education (GISE) was founded in 1986 and supported by the College of Science, and science education scholars at NTNU. Our doctoral degree and master's degree programs

in science education were respectively established in 1986 and 1994. Each program started to enroll students one year after their establishment.

Our faculty members are composed of five fulltime professors (Chun-Yen Chang, Ying-Shao Hsu, Fang-Ying Yang, Hsin-Kai Wu,, and Shiang-Yao Liu), three associate professors (Miao-Hsuan Yen, Su-Chi Fang and Jr-Hung, Lin), and one assistant professor

( Chia-Hui Cheng). In total, we currently have nine full-time faculty members specializing in different areas of science education.

## Instructional Objectives

Objectives of the Master's Program:

- 1.To develop the student's professional knowledge and competencies in excellent science teaching.
- 2.To foster the student's science teaching in elementary, secondary, and vocational schools.
- 3.To cultivate the student's interdisciplinary understanding to meet the need of talents in education fields.

Objectives of the Doctoral Program:

- 1.To develop the student's research knowledge and competencies to become an excellent science education researcher.
- 2.To foster and prepare the student to become an excellent instructor in teaching science and science education courses at the university level.
- 3.To cultivate the student's knowledge of general education in mathematics and science.

## Degree Requirements

The total graduation credit requirements for master's students at GISE are listed below based on the major of their undergraduate studies:

| Category | Undergraduate major  | Minimum credits required |            |  |                 |                      | Minimum graduation credits* |
|----------|--|--------------------------|------------|--|-----------------|----------------------|-----------------------------|
|          |  | Required credits         |            | Elective credits                       |                 |                      |                             |
|          |  | Seminar                  | Colloquium | Science Education Specialized Subjects | Science Subject | Research Methodology |                             |
| I        | Math, science, or other related fields                                   | 4                        | 4          | 12                                     | 9               | 5                    | 34                          |
| II       | Natural science education, math education, or math and science education | 4                        | 4          | 9                                      | 12              | 5                    | 34                          |
| III      | Others   | 4                        | 4          | 12                                     | 12              | 5                    | 37                          |

\* Note:

A master's student must complete at least 24 credits of PhD courses, PhD/Master's cross-listed courses, or master's courses.

The total graduation credit requirements for PhD students at GISE are listed below based on the major of their master's studies:

| Category | Master's major                         | Minimum credits required |            |  |                 |                      | Minimum graduation credits* |
|----------|--|--------------------------|------------|--|-----------------|----------------------|-----------------------------|
|          |  | Required credits         |            | Elective credits                       |                 |                      |                             |
|          |  | Seminar                  | Colloquium | Science Education Specialized Subjects | Science Subject | Research Methodology |                             |
| I        | Math, science, or other related fields | 8                        | 8          | 15                                     | 6               | 6                    | 43                          |
| II       | Science education                      | 8                        | 8          | 12                                     | 12              | 3                    | 43                          |
| III      | Others                                 | 8                        | 8          | 15                                     | 12              | 6                    | 49                          |

\* Note:

A PhD student must complete at least 18 credits of PhD courses, PhD/Master's cross-listed courses.

## Feature of the Curriculum

To help students obtain a broad understanding of science education, the graduate curriculum is organized in accordance with 4 research themes:1) Cognitive Perspectives on Science Learning, 2) Science and Society, 3) Digital Learning and 4) Curriculum, Instruction and Assessment. To develop solid research skills, students in our institute are often involved in government-sponsored research projects during their graduate studies. Other than the basic graduate requirements, there are various student exchange programs and opportunities for international collaboration, helping students to gain international experience in science teaching and science education research.

## Career Prospects

By January 2025, 104 students completed the doctoral program, and 346 students completed the master's program. Our alumni work at all levels of education nationally and internationally, including K-12 schools, colleges, universities, academic research institutions, and public or private organizations.

