

# EDUCATIONAL STUDIES (PH.D.): MATHEMATICS AND SCIENCE EDUCATION

**Offered by:** Integrated Studies in Ed (Faculty of Education)

**Degree:** Doctor of Philosophy

## Program Description

This Ph.D. concentration emphasizes research in mathematics and science education, including a specific focus on teacher education in the area of math and science. Graduates will gain sufficient research experience to conduct empirical research in math and science education and sufficient teacher education experience to assume roles as teacher educators in university or other settings. The program includes targeted opportunities for candidates to develop skills, knowledge, and practices specific to teaching and learning mathematics and science, mathematics and science teacher preparation, and research in both of these areas. Applicants for the Ph.D. concentration in mathematics and science education would be expected to already have a Master's degree that included educational research.

**Note:** For information about Fall 2025 and Winter 2026 course offerings, please check back on May 8, 2025. Until then, the "Terms offered" field will appear blank for most courses while the class schedule is being finalized.

## Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

## Required Courses (17 credits)

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Course	Title	Credits
EDEC 624	Researching, Teaching, Learning and Teacher Education.	3
EDEC 700	Proseminar in Education 1.	2
EDEC 701	Ph.D. Comprehensive Examination.	0
EDEC 702	Proseminar in Education 2.	2
EDEC 703	Ph.D. Colloquium.	4
EDEC 708	PhD Seminar in Practice-Based Teacher Education 1.	3
EDEC 709	PhD Seminar in Math and Science Education 2.	3

Note: EDEC 701 Ph.D. Comprehensive Examination. is normally taken at the end of the second year for Ph.D. 2 program entrants and at the end of the third year for Ph.D. 1 entrants.

## Complementary Courses (3-9 credits)

3 credits of graduate-level courses in curriculum, from the following:

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Course	Title	Credits
EDEC 646	Sociocultural and Epistemic Understandings of Science.	3
EDEC 647	Sociocultural and Epistemic Understandings of Mathematics.	3

0-3 credits of advanced quantitative methods, as listed below. Students who have taken an equivalent course in quantitative methods, or are currently taking an equivalent course as part of their Ph.D. program requirements, will be deemed to have satisfied these credits.

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Course	Title	Credits
EDPE 682	Univariate/Multivariate Analysis.	3

0-3 credits of qualitative methods or advanced research design from the following: Students who have taken an equivalent course in qualitative methods or advanced research design, or are currently taking an equivalent course as part of their Ph.D. program requirements, will be deemed to have satisfied these credits.

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Course	Title	Credits
EDEC 630	Ethnographic Approaches to Research .	3
EDEC 706	Textual Approaches to Research.	3
EDEC 707	Interpretive Inquiry.	3
EDEM 692	Qualitative Research Methods.	3

## Elective Courses (0-9 credits)

Depending on the student's prior coursework and in consultation with the Supervisor and/or Doctoral Advisory Committee, an additional 0-9 credits of elective courses at the 500 level or higher may be required.