Science, Technology, Engineering, and Mathematics Education
(TCHLRN-PH, STE)
Specialization leading to Doctor of Philosophy in Teaching and Learning

Core Requirements (20 hours)

Teaching and Learning Required Courses (choose two, 8 hours)
EDUTL 8003 Theorizing and Researching Teaching and Learning (4)
EDUTL 8015 Diversity and Equity in Education (4)

Research Requirement (choose three, 9 hours)
Take a minimum of 9 semester hours of research methods. Choose a qualitative focus, a quantitative focus, or a combination. Recommended courses are listed below. Students may select courses from beyond this list with the approval of the advisor and the Graduate Studies Committee

Qualitative
EDUTL 7431 The Ethnography of Communication 1 (3)
EDUTL 7432 The Ethnography of Communication 2 (4)
EDUTL 8001 Discourse Analysis and Educational Research 1 (4)
EDUTL 8002 Discourse Analysis and Educational Research 2 (4)
ESQUAL 8280 Qualitative Research in Education: Paradigms, Theories, and Exemplars (3)
ESQUAL 8290 Qualitative Research in Education: Methods and Analysis (3)

Quantitative
ESQREM 6625 Introduction to Educational Research (3)
ESQREM 6641 Introduction to Educational Statistics (3)
ESQREM 7627 Sampling Designs and Survey Research Methods (3)
ESQREM 7648 Univariate Experimental Design (3)
ESQREM 8648 Multivariate Experimental Designs (3)

Breadth Requirement (choose one, 3 hours)
Take at least one course outside of specialization but within in Teaching and Learning.
EDUTL Breadth Requirement (3)
Specialization Requirements (24 hours)

Students must meet with a faculty advisor within the first two semesters to plan a program of study. With the approval of a faculty advisor and the Graduate Studies Committee, the program of study may deviate from the curriculum below depending on scholarly and research interests.

Required Courses (15 hours)

EDUTL 8711  Current Issues and Trends in STEM Education (3)
EDUTL 8721  Advanced Study of Thinking, Learning, and Assessment in Mathematics Education (3)
EDUTL 8731  Teaching & Teacher Education in STEM Education (3)
EDUTL 8741  History of Curriculum in STEM Education (3)
EDUTL 8751  Survey and Critical Analysis of Research in STEM Education (3)

Supporting Courses (choose three, 9 hours)

EDUTL 7715  Learning Progression in Mathematics Education (3)
EDUTL 7716  Conceptual and Procedural Knowledge in Mathematics Education: Theory, Research, and Controversy (3)
EDUTL 7723  Learning Progressions in Science Education (3)
EDUTL 7725  The Nature of Science and Implications for Science Teaching (3)
EDUTL 7731  Multimedia Tools for STEM Education (3)
EDUTL 7741  Advanced Study of Learning and Cognition in STEM (3)
EDUTL 7742  Knowledge Representations in STEM Learning (3)
EDUTL 7746  Integrating Teaching, Learning and the Brain: Processing Information (3)
EDUTL 7747  Science, Mathematics, Technology and the Educated Mind (3)
EDUTL 7748  Engaging Community & Culture to Teach STEM (3)
EDUTL 7749  History, Future, and Practical Applications of Concept Inventories in STEM Education (3)
EDUTL 6892  Special Topics in Education (3)
EDUTL 8890  Advanced Seminar (1-4)
FABENG 7220  College Teaching in Engineering (2)

Research Apprenticeship (6 hours)

EDUTL 8998  Research Apprenticeship in Teaching and Learning (2-8)

Candidacy Examinations

Students must be registered for at least 3 graduate credits during the semester in which the candidacy examination is completed. These need not be additional, Individual Study hours.

EDUTL 7193  Individual Studies (1-15)

Dissertation Research (6 hours)

EDUTL 8999  Research (1-15)

Note: Students' exact curriculum may vary depending upon program of study determined by student and advisor, and approved by the Graduate Studies Committee.