About the Program

The interdisciplinary Ph.D. program in Education, with a concentration in Math and Science Education, prepares students to contribute new knowledge to the field of mathematics and science learning. The program defines math and science learning very broadly, preparing students to take on a variety of roles in mathematics and science education. Students can focus on any aspect of teaching and learning inclusive of students, teachers, and adult learners. However, because of our strategic location in North Philadelphia, we have a strong and demonstrated commitment to issues of teaching, learning, and schooling in urban contexts. The program is grounded in the dual belief that education is a primary mechanism for social justice and that educational research has the capacity to improve the material conditions of people’s lives.

The doctoral program in Math and Science Education prepares students in two ways: through academic coursework and through an intensive mentoring relationship with various faculty members. Coursework emphasizes a broad knowledge of critical lines of inquiry in mathematics or science education and the development of research and analytic skills. Research opportunities include working alongside prominent faculty on federally funded projects; exposure and presentations at regional and national conferences; and co-authoring papers for publication in top-tiered journals. Practice and research are blended in a program that promotes both teaching and learning.

Time Limit for Degree Completion: 7 years

Campus Location: Main

Full-Time/Part-Time Status: Students may matriculate either full-time or part-time. Most courses are offered in the evening to accommodate working professionals. The length of time to complete the doctoral degree program varies depending on the number of courses taken each term.

Job Prospects: Graduates are prepared to teach Mathematics or Science.

Non-Matriculated Student Policy: Students may take up to, but not more than, 9 credits of graduate study in the program before being admitted to the program. The credits transfer into the program, if the student is admitted. Students completing non-matriculated courses before being admitted to the program are NOT guaranteed admission.

Financing Opportunities: Financial support opportunities may include assistantships, fellowships, scholarships, tuition remission, graduate student employment, and other financial aid such as grants, loans, and federal work study.

Admission Requirements and Deadlines

Application Deadline:

Fall: December 1

Applications are accepted for the Fall term only. Applicants should submit all required admissions documents by the application deadline to receive priority consideration for admission and financial support.

APPLY ONLINE to this graduate program.

Letters of Reference:

Number Required: 2, with a third submitted at the applicant's discretion. Please submit the "Reference Report for Graduate Study," found at http://www.temple.edu/grad/admissions/documents/Web_GRAD_REFERENCE_REPORT.pdf.

From Whom: Letters of recommendation should be obtained from college/university faculty members and others who can provide insight into the applicant's academic competence.

Master's Degree in Discipline/Related Discipline: A master's degree is not required, although the Ph.D. program requires 48 credits post-master's in a relevant field. Thus, applicants without a master's degree are required to complete 30 credits beyond those required for the Ph.D.

Bachelor's Degree in Discipline/Related Discipline: All applicants must present credentials that are the equivalent of the appropriate baccalaureate degree at Temple University. Official transcript(s) showing all undergraduate and graduate coursework must be submitted. A minimum GPA of 3.0 on a 4.0 scale is expected at both the undergraduate and graduate levels, although applicants may be admitted if other compelling evidence of academic potential is presented.

Statement of Goals: The personal statement is an important factor in the admissions process. Written in autobiographical style, it should explain your reasons for pursuing a doctoral degree in Education in a thorough and thoughtful manner. The statement should address the following:
• How have your personal, academic, and professional experiences shaped your research interests, and how might a doctoral program in Education help you explore those interests?
• How does the doctoral program at Temple fit your individual interests, needs, and future goals, and which faculty member's research best matches your own interests?
• What academic/professional goals would the program help you to achieve following graduation?

Standardized Test Scores:

GRE: Official scores are required to be reported from the test taken no more than 5 years prior to submitting an application.

TOEFL score (international applicants only): 79 iBT or 550 PBT minimum.

Resume: Current resume required.

Writing Sample: The academic writing sample should be a paper written for a class within the last five years. If a recent paper is not available, an op-ed piece on an educational issue of the applicant’s choosing should be composed. The op-ed should be 3 to 5 pages and of the sort that might appear in The New York Times, Philadelphia Inquirer, or Education Digest.

Program Requirements

General Program Requirements:
Number of Credits Required Beyond the Master's: 48
Number of Credits Required Beyond the Bachelor's: 78

Required Courses:

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<th>Course Code</th>
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<td>EDUC 8103</td>
<td>Contemporary Trends in Educational Research</td>
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<td>EDUC 8104</td>
<td>Epistemology and Method in Educational Research</td>
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College-Wide Research Method Courses

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Math and Science Concentration Courses

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<tr>
<td>EDUC 8103</td>
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<tr>
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Research Apprenticeship

6

Culminating Courses

6

Total Credit Hours

48

1 A minimum of 15 credits should include at least one course each in statistics, qualitative methods, and research design.
2 Students should consult with their assigned faculty advisor for appropriate course selection.
3 Of the 6 credits overall, a minimum of 2 credits of EDUC 9999 Doctor of Education Dissertation must be taken.

Internship: An internship in the form of a research apprenticeship is required.

Culminating Events:

Preliminary Examination:
The purpose of the preliminary examination is for students to demonstrate their development in the three core areas of a faculty member’s life: research, teaching, and service. The exam requires students to undertake an integrative analysis of research; to demonstrate that they can bring research and theory into effective practice in their teaching; and to exhibit their ability to provide professional service. Preliminary exams are evaluated by a committee of faculty in the concentration. Evaluators look for a breadth and depth of understanding of research and theory; a critical application of that knowledge to specific phenomena and to teaching; integrative reasoning ability; and an ability to write technical prose.

Proposal with Oral Defense:
The dissertation proposal demonstrates the student’s knowledge of and ability to conduct the proposed research. The proposal should consist of the context and background surrounding a particular research problem; an exhaustive survey and review of literature related to the problem; and a detailed methodological plan for investigating the problem. The proposal should be completed and approved no more than one year after completing coursework.

The proposal is defended in an open hearing attended by the student’s Doctoral Advisory Committee, which is formed to oversee the student’s doctoral research and is comprised of at least three Graduate Faculty members. Two members, including the Chair, must be from, or affiliated with, Math and Science Education. The Chair is responsible for overseeing and guiding the student’s progress, coordinating the responses of the committee members, and informing the student of her/his academic progress. Upon approval of the proposal by the Doctoral Advisory Committee, a timeline for completing the investigation and writing process is established.

Dissertation with Oral Defense:
The doctoral dissertation is an original study that makes a significant contribution to the field. It should expand the existing knowledge and demonstrate the student’s knowledge of both research methods and a mastery of her/his primary area of interest. Dissertations should be rigorously investigated;
uphold the ethics and standards of the field; demonstrate an understanding of the relationship between the primary area of interest and the broader field of business; and be prepared for publication in an academic journal.

The Dissertation Examining Committee evaluates the student’s dissertation and oral defense. This committee is comprised of the Doctoral Advisory Committee and at least two additional faculty members, one of whom must be from outside Math and Science Education. The Dissertation Examining Committee evaluates the student’s ability to express verbally her/his research question, methodological approach, primary findings, and implications. The committee votes to pass or fail the dissertation and the defense at the conclusion of the public presentation.

Students who are preparing to defend their dissertation should confirm a time and date with their Dissertation Examining Committee and register with the Shimada Resource Center at least 10 days before the defense is to be held. After the time, date, and room for the defense have been established, the completed “Announcement of Dissertation Defense” form, found at http://www.temple.edu/grad/forms/, is sent to the Graduate School. A flyer announcing the defense is posted in a public location in the College.

Contacts

Program Web Address:
http://education.temple.edu/phd/math-and-science-education

Department Information:

Math and Science Education Ph.D. Program
College of Education
1301 Cecil B. Moore Avenue
Philadelphia, PA 19122-6091
educate@temple.edu
215-204-0999

Submission Address for Application Materials:

http://apply.temple.edu/coe

Department Contacts:

Admissions:
Office of Enrollment Management
educate@temple.edu
215-204-0999

Courses

EDUC 5010. Special Topics in Education. 1 to 4 Credit Hour.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

EDUC 5011. Entrepreneur Thinking-Ed. 3 Credit Hours.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5101. Critical Understanding of Social Science Research. 3 Credit Hours.
This is an introductory course in understanding research for graduate students who will primarily be consumers of research, such as Masters and Specialist students. It will also serve as an introduction to research for doctoral students in applied fields (EdD and PsyD), who may go on to do applied research and take other research courses such as Program Evaluation or Single-Subject Research. It introduces students to the principles of social scientific research and the components of the research process. We also discuss the ethical issues inherent within any research involving human subjects. Conceptual, procedural, and analysis issues from quantitative, qualitative, and mixed methods research traditions will be covered, ranging from clinical trials and experimental designs to ethnographies in real-life settings. Because the scope of the course is quite broad, it will not be possible to cover all of the details of every design and method used in educational research. Nevertheless, by the end of the course you should be aware of a range of procedures that may be applied to different types of educational studies. You will also be aware of the guidelines that should be used in selecting a set of appropriate research methods and in evaluating research. You will also learn about the role of theory in educational research and how theoretical and conceptual frameworks inform research questions and the choice of data and methods.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.
EDUC 5115. The Context of Education. 3 Credit Hours.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5203. Effective Teaching: Theory and Practice. 3 Credit Hours.
Provides theoretical and research basis for effective teaching strategies and affords the opportunity to practice the skills in simulated classroom conditions. Emphasizes the mastery of each skill. Exposure to a variety of teaching procedures and to a choice of the most appropriate strategy in a given educational situation.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5204. Literacy N-6. 3 Credit Hours.
Examines theoretical models in reading and language arts and their applications to early childhood/elementary and classroom practices, K-6. Provides opportunities for students to focus on developmental and application issues in literacy learning, the integration of reading and language arts, and alternative assessment techniques.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5205. Numeracy N-12. 3 Credit Hours.
A study of how numeric concepts and computational logic contribute to science, social studies, English language arts, and other subject areas. Students in various disciplines learn how to apply these concepts and logic to their own classrooms.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5207. Early Childhood/Elementary Environments and Learning. 3 Credit Hours.
Guides students as prospective early childhood/elementary teachers in establishing and maintaining learning environments for children. Research based principles for effective teaching and developmentally appropriate curriculum practices are presented and supported with authentic classroom based examples. Helps students utilize proven systematic approaches that will enable them to organize, conduct, and evaluate instructional practices in preschool and elementary settings. Guided by two beliefs: (1) that students need to engage actively with the concepts presented in the course outline, and (2) that students should be exposed first hand to the realities of teaching in urban settings.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5211. Creating a High School Learning Community. 3 Credit Hours.
Utilizes the natural and social sciences jointly as the vehicle to exemplify to the student (1) the processes associated with stimulating the learners’ integration of thinking skills toward higher order problem resolution, and (2) the strategies aimed at socialization of the learners into a learning community.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5212. Curriculum, Instruction, and Technology in Education. 3 Credit Hours.
This 3 semester hour graduate course provides an introduction to the concepts, theories, and practices that address the linkages between the curriculum, instruction and technology. In particular, this course focuses on the implementation, management, and administration of technology infrastructure (hardware and software) at the building, school, and district levels.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5215. Standards & Tchg Pract. 1 to 3 Credit Hour.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.
EDUC 5221. English for Foreign Students. 3 Credit Hours.
The focus of this course is on English skills needed for instructional purposes. The course offers students opportunities to develop communicative skills necessary for successful teaching and information about teaching in U.S. institutions of higher education (e.g., syllabi, instructional formats, and legal issues, such as sexual harassment and plagiarism). Note: This course is for ITA students.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5229. Crit Thk Val Clar & Inq. 1 to 3 Credit Hour.
This course examines the tension that exists between curriculum requirements (especially as measured by high stakes testing) and the need to teach students critical thinking and responsibility. Participants will incorporate classroom climate techniques (character education, anti-bullying programs, etc.) into their curriculum development and their instructional planning.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5231. Col Studies AT2 (CSAT 2). 1 to 3 Credit Hour.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5232. Col Studies AT3 (CSAT 3). 1 to 3 Credit Hour.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5241. Comp Rdg Instruction. 3 Credit Hours.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5242. Lit for Mid Level Learnr. 3 Credit Hours.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5243. Col Studies AT1 (CSAT1). 1 to 3 Credit Hour.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5244. Class Discourse. 3 Credit Hours.
The purpose of this course is to provide doctoral students with the theory and framework to study classroom discourses. According to Gee (1989), discourse "integrates words, acts, values, beliefs, attitudes, and social identities as well as gestures, glances, body positions, and clothes" (p. 7). In this broad context, we will examine student discourses in reading/language arts, mathematics and science in both in school and out-of school contexts. We use vignettes from Courtney Cazden's text as a model to critique classroom discourses among teachers and students. We also examine transcribed texts to find linguistic patterns in reading, mathematics and science classrooms. Finally, we use rubrics to judge the quality of classroom discourses to illustrate content knowledge.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5254. Characteristics of Computer-Based Instruction. 3 Credit Hours.
Application of computer technology in instructional programs. Discusses prospects and problems of the uses of computers and other technologies (e.g., interactive whiteboards) in support of direct instruction, management, and testing. Hands-on experience is included.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5255. Tech in Classrooms: TPCK. 3 Credit Hours.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.
EDUC 5257. Elem Sch Rdg Instr. 3 Credit Hours.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may not be repeated for additional credits.

EDUC 5258. Second Sch Read Inst. 3 Credit Hours.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may not be repeated for additional credits.

EDUC 5259. Tch Rdg & Lang to Spec. 3 Credit Hours.
This course focuses on understanding a) reading, b) reading problems, c) assessment strategies, and d) effective, research-based, teaching practices for students with special needs. "Students with special needs" includes but is not limited to those with poor reading, writing, and speaking skills, learning disabilities, and cultural, economic, and language differences. The goal of the course is provide each student with first-hand knowledge, skills, and solutions to address children's reading problems. Questions that guide this course include: What are the causes of low language and literacy abilities among students? How do we assess students with poor reading and writing skills? What reading and language arts strategies are most effective with students with special needs? What education and psychology of reading theories inform these practices? How can we practice inclusion during reading and language art lessons? What additional services are available to support all children's success in the classroom?
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may not be repeated for additional credits.

EDUC 5261. Beginning Rdg Instructn. 3 Credit Hours.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may not be repeated for additional credits.

EDUC 5262. Introduction to Qualitative Research. 3 Credit Hours.
Several qualitative research designs will be reviewed, including discussions of phenomenology, grounded theory, interpretive paradigm, narratives, histories, and ethnography. Research strategies/methods will be critiqued, including interviewing, participant-observation, and textual/content analysis. Important concepts for this course are appropriate research questions, study design, data collection methods, data management, managing the study, data analysis, interpretation of results, and presenting the study to peers. Qualitative data analysis will be introduced, but the emphasis is on research design and data collection. Combining qualitative and quantitative data will also be discussed.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may not be repeated for additional credits.

EDUC 5272. Instl Pract Middle Class. 3 Credit Hours.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may not be repeated for additional credits.

EDUC 5275. Seminar in Supervised Teaching. 3 Credit Hours.
Describes basic principles of human behavior in relation to managing classrooms and the teaching of academic skills. Examples of successful applications of the principles are provided. Students required to use the principles and procedures in their classrooms and to report the outcomes to the participants in the class.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may not be repeated for additional credits.

EDUC 5287. Practicum in Teaching. 3 Credit Hours.
Introduces students to the process of teaching children in an elementary or high school environment. Under the direction of a Temple University faculty member, the student observes elementary or high school students in a variety of situations. Classroom discussions are held in conjunction with observed events and suggestions are made as to how to deal with a variety of management and academic problems. The course is a prerequisite to ED 406 and 412, and is taken in conjunction with ED 403 at the start of the student's program.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may be repeated for additional credit.
EDUC 5321. Instructional Innovation and Entrepreneurship. 3 Credit Hours.
This course in advanced teaching methods will focus on cutting edge pedagogy and new trends in teaching and learning. The course will be inquiry-based so that teachers across grade levels and disciplines can research and report on promising new methods, including but not limited to methods that take advantage of new technologies. Each student will create a unit of instruction using innovative new pedagogy and present that unit to the class. The course will encourage and nurture innovative and entrepreneurial thinking, creating a model for teacher innovation and entrepreneurship. It will also focus on creative strategies for enabling all students to meet learning goals.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5325. Introduction to Statistics and Research. 3 Credit Hours.
An introductory course which focuses on basic research and statistical concepts. The course will cover both descriptive and inferential statistics from the perspective of an informed consumer of empirical research. There are no prerequisites for the course. The purpose of this course is to enable students to interpret and use a variety of descriptive and inferential statistical procedures that are commonly used in education and the social sciences. Topics covered in the course include an introduction to research design, sampling, descriptive statistics, t-test, Pearson correlation, univariate analysis of variance, and non-parametric statistical tests. Emphasis will be on the proper use and interpretation of these statistical procedures. The course does not emphasize the calculation of statistics, and mathematical sophistication is not assumed.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5327. Teacher Leadership and the Teaching Profession: A Guide for Action. 3 Credit Hours.
This course provides an historical perspective on the teaching profession as well as a close look at the status of teaching today, including the development of associations and teacher unions, content-based organizations of teachers like the National Council of Teachers of English, the formation of teacher networks, and national organizations like the National Board for Professional Teaching Standards. It will look at all aspects of teaching including teacher preparation, teacher professional development, teacher advocacy, and the future of the teaching profession. In this context, the course will raise questions about the role and status of teachers in contemporary American society, how teaching fares in public policy debates, and the assumptions about teaching that underlie new federal and state requirements for teacher preparation and professional development. We will examine recent proposals to assess teachers using various frameworks and to include student test scores as a measure of teacher quality and teacher success. Designed for teacher leaders, school leaders, and other education professionals, this course will place teaching and teacher quality at the center of any discussion about the goals of education, student achievement, and school success. It will focus on the conditions necessary for good teaching and learning to occur and how teachers can help to create those conditions in their own classrooms and in collaboration with their peers and administrators.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5401. Intro to Middle School. 3 Credit Hours.
This course will introduce you to the middle school concept. Characteristics of middle schools will be discussed, including teaming, interdisciplinary units, and literacy across the content areas. Important aspects of the middle school environment, such as collaborating with specialists and creating a learning environment in the classroom, will be emphasized. Field experiences will be in the form of focused observations and interviews.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 5402. Child and Adol Develop. 3 Credit Hours.
This course will focus on issues of child and adolescent development that are relevant for educators. Development (e.g., physical, cognitive, social) and learning theories will be examined through discussions of theory and research. Particular attention will be paid to the early adolescent. Field-based experiences, in the form of focused observations and interviews, will support these discussions. Group and individual differences will be emphasized.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.
EDUC 5403. Diverse Lrns in Class. 3 Credit Hours.
Through this course, students will gain expertise in applying best practices to ensure access, equity, and quality education for all students. This course will introduce you to the characteristics and special needs of students having disabilities and of students who are culturally and linguistically diverse. The complex and critical issues surrounding inclusive and heterogeneous schooling will be examined along with the establishment of collaborative relationships with fellow colleagues, members of the school community and families. This course provides an overview of theory, research and practice in teaching culturally and linguistically diverse students in the middle grades. Students will learn about the socio cultural characteristics of ELLS and how the process of acquiring multiple languages and literacy skills affects students' learning of academic content. Students will be introduced to approaches for adapting science and math content for English language learners.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may not be repeated for additional credits.

EDUC 5406. Teach Math Middle Gr II. 3 Credit Hours.
This course is part of a sequence of courses within the e=mc2 Transition to Teaching graduate certification program. This course will be taught in the third semester for those in the mathematics track. This course will focus on geometry, measurement, and data, as appropriate for the middle grades. This continuation course will again focus on the particular mathematical and pedagogical knowledge needed for teaching, including issues of planning, instruction, and assessment. Field experience will be in the form of student teaching, and this course will allow for reflection on this experience. Support will be provided for student motivation, classroom management, and other realities of teaching.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may not be repeated for additional credits.

EDUC 5407. Teach Sci Middle Gr II. 3 Credit Hours.
This course is part of a sequence of courses within the e=mc2 Transition to Teaching graduate certification program. This course will be taught in the third semester for those in the science track. This continuation course will again focus on the particular pedagogical knowledge needed for teaching including issues of planning, instruction, and assessment. Field experience will be in the form of student teaching, and this course will allow for reflection on this experience. Support will be provided for student motivation, classroom management, and other realities of teaching. Whereas the first methods course was focused on the big ideas in the various disciplines in science, this course will focus on the cross-cutting themes in science as identified in the National Science Education Standards: systems, order, and organization; evidence, models, and an explanation; change, constancy, and measurement; evolution and equilibrium; form and function.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may not be repeated for additional credits.

EDUC 5409. Research Methods and Induction Capstone. 3 Credit Hours.
This course will provide a vehicle to synthesize learning, reflect on experiences throughout the program, and consider issues related to the first year of teaching. Special topics include behavior problems, teacher stress, first year of teaching, professional development, and action research.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may not be repeated for additional credits.

EDUC 5488. St Tchg in Middle Grade. 3 Credit Hours.
This field experience involves 9 weeks of full-time student teaching. Prospective teachers will be placed in a middle grades mathematics or science classroom, where they will work under the guidance of a mentor teacher. Experiences include observing, assisting, and delivering whole class instruction. NOTE: All coursework must be completed before taking this course.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
College Restrictions: Must be enrolled in one of the following Colleges: Education.
Student Attribute Restrictions: Must be enrolled in one of the following Student Attributes: Clearance for Education.
Cohort Restrictions: Must be enrolled in one of the following Cohorts: EDCNDCY.
Repeatability: This course may be repeated for additional credit.

EDUC 5605. Models of Teaching. 3 Credit Hours.
Models of teaching are studied to better understand their goals and strategies, and to support new teachers in developing broader perspectives regarding teaching practice and their implications for student learning.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may not be repeated for additional credits.
EDUC 5888. Supervised Teaching. 3 or 4 Credit Hours.
Involves full-time placement in an elementary or secondary school for the entire semester. Students with paid teaching positions may use the school site; others are placed in a school and work with a cooperating teacher. All students supervised by Temple University faculty member.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

EDUC 8102. Ethnographic Research Methods. 3 Credit Hours.
This class will use an in-depth study of ethnographic methods to develop qualitative data collection skills. Ethnography is one type of qualitative research. It uses the study of people in their natural settings to attempt to understand their social world, culture, and the meanings they make of their experiences in social contexts. According to LeCompte and Schensul, "ethnography takes the position that human behavior and the ways in which people construct and make meaning of their worlds and their lives are highly variable and locally specific...[Thus,] ethnographic researchers learn through systematic observation in the 'field,' by interviewing and carefully recording what they see, hear, and observe people doing, while also learning the meanings that people attribute to what they do and the things they make" (LeCompte and Schensul, pp. 1-2). Because ethnographic research is intensive and involves a variety of data collection techniques - observations, interviews, and document analysis - learning ethnography is a good way to explore all of these techniques.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 8103. Contemporary Trends in Educational Research. 3 Credit Hours.
The purpose of the course is to provide a fundamental step in the development of a research orientation of educational phenomena through introducing students to the domain of educational research and to the kind of research questions asked by educational researchers when assuming disciplinary as well as interdisciplinary perspectives.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 8104. Epistemology and Method in Educational Research. 3 Credit Hours.
The purpose of the course is to provide a fundamental step in the development of a research orientation of educational phenomena through introducing students to the epistemological foundations and research methods of educational research.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 8232. Technology, Teaching, and Learning. 3 Credit Hours.
Focuses on educational technologies and the ability of technology to enhance both program administration and teaching and learning for youth and adults in school and non-school settings. The ethical, social, and scientific ramifications of technological developments in education and how these developments affect the teaching and learning process are discussed. Application of instructional technologies in education, business, and industry presented.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 8251. Teacher Development: The Reflective Teacher. 3 Credit Hours.
Designed for practitioners interested in enhancing their skills of reflection with an eye on improving classroom practice. The fundamental components of teaching and learning will provide the foci for discussion, inquiry and reflection. The course will be largely experiential, providing participant's ample opportunity to participate directly in activities designed to provoke introspection and critical analysis.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.
EDUC 8252. Cultural Diversity and Learning Styles. 3 Credit Hours.
This course rests on three premises: (1) Because differences among learners affect learning, those differences should inform teaching, (2) Master teachers make informed judgments about learners’ needs and interests, and (3) Master teachers use both these judgments and student performance data to inform instruction. This course aims to encourage teachers to consider the usefulness of these three premises for improving student performance.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 8253. Accom Tchr: Nbpts Process. 3 Credit Hours.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 8271. Program Planning and Evaluation. 3 Credit Hours.
Program planning and evaluation are viewed and discussed from a lifespan perspective that incorporates program planning and evaluation for school, post-secondary and higher education, continuing education, community-based, and training and development settings. Students are encouraged to apply program planning content and processes in real educational settings, which may be school or community based.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 8272. Adv Classroom Mgt. 3 Credit Hours.
Students will study many of the teacher-controlled environmental variables which influence learning in the classroom. Particular emphasis will be placed on discovering and assessing practical and theoretical instructional strategies related to behavior management, classroom organization, differentiated and adapted teaching techniques, lesson design, motivation, and assessment. Techniques used will include teacher presentations, discovery learning, panel discussions, cooperative learning structures, group and individual projects. Assessment will be based on course participation and a summative portfolio.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 8273. Adv Coop Learning. 3 Credit Hours.
Through readings, lectures, class discussion and instructor-led activities, students enrolled in this course will be able to (1) describe research-based outcomes achievable through cooperative learning and (2) design and implement a number of practical, cooperative learning models for achieving specific learning objectives.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 8274. Curnt Issu/Curr & Instruc. 2 to 3 Credit Hours.
This course invites students to thoughtfully review what is currently considered best instructional practices. Special emphasis will be given to the organization, management, and evaluation of instruction.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 8275. Research Design in CITE. 3 Credit Hours.
Students are provided with practical experience in formulating research problems and designing appropriate methods to address those problems within a lifelong perspective of education and learning. An overview of various research designs, including both qualitative and quantitative designs are conducted. Students are expected to learn how to design research.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 8276. International Ed Seminar. 1 to 9 Credit Hour.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.
EDUC 8278. Found Theor Res Reading. 3 Credit Hours.
This course will examine influential theories and research that address the psychological, cognitive, sociocultural, literary and linguistic foundations of reading. During the first part of the course we will consider how leading and often competing reading theories developed over time as well as how seminal research studies were conducted and considered by scholars, practitioners and policy makers. From there we will then focus on research propelling current conversations in the literacy field in

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 8279. Found Theor Res Writing. 3 Credit Hours.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 8289. Capstone Seminar Cur Iss. 3 Credit Hours.
This course, taken near the end of the program, will focus on current educational issues and the research surrounding them. In addition, it will include an experiential activity that will form a bridge between the student's career and the coursework of this program, especially the student's specialization or focus.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 8545. Social Cntxt Math Sci Ed. 3 Credit Hours.
This course examines research from a socio-cultural perspective on mathematics and science education. We will investigate research on students' everyday mathematics and science and its relationship to learning these subjects in schools; the relationship between culture, language, and mathematics teaching and learning; and issues of race, social class, and gender in mathematics and science education. Finally, we will examine how national, state, and local policies influence mathematics and science teaching and learning, with particular attention placed on issues of equity and access.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 8727. Foundations Math Sci Ed. 3 Credit Hours.
This course will introduce students to the foundations of math and science education. It will examine trends in the history of math and science education, consider major philosophical arguments about learning math and science, and analyze the portrayal of math and science in the K-12 classroom. Simultaneously, we will focus on what it means to do math and science and on understanding the practices and habits of minds of mathematicians and scientists.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EDUC 8730. Res Topics Sci Ed. 3 Credit Hours.
This doctoral level course will explore current research in science education. Key questions will be explored and current literature on that topic will be read and critiqued. Faculty in the program area will alternate teaching this course and the topics will vary from year to year. As a result, this course can be taken up to 3 times. Topics that this course will explore are demonstrations in the classroom, scientific inquiry, professional development, classroom-based research, technology in the science classroom among other topics.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

EDUC 8731. Psych of Learning Math. 3 Credit Hours.
This doctoral seminar will focus on psychological theory and research relating to the learning and teaching of mathematics. The main emphasis will be on developing solid conceptions of what it means to know and understand mathematics from a psychological perspective.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.
EDUC 9255. Res.Seminar/Math/Sci Ed. 3 Credit Hours.
This three credit graduate course will introduce you to a subset of major research lines emerging in the fields of mathematics and science education. We will examine the research literature to understand the "hot topics," focusing on those that are currently in debate in the fields. While the course will be focused around topics that affect both fields, readings will help us understand how these topics are being conceptualized in the individual areas of science education and mathematics education. In addition to these topics, this course will continue building and developing the skills that doctoral students will need in order to be successful in their graduate programs and in their professional lives. In particular, this course will focus on developing skills related to writing integrated reviews of research, necessary both for your dissertation and publication. Specific skills focused on in this course will be: situating your research within a larger context (i.e., asking meaningful and answerable (!) questions), identifying focus of specific journals, and writing a critical literature review.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may not be repeated for additional credits.

EDUC 9257. Problems in Education. 1 to 6 Credit Hour.
Limited to matriculated doctoral students and those with permission of instructor. Specified problems, research, and practice in education. May be repeated for credit when approved by the instructor. Specific offering changes from semester to semester; contact advisor.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may be repeated for additional credit.

EDUC 9282. Graduate Independent Study in Curriculum, Instruction, and Technology. 1 to 6 Credit Hour.
Limited to matriculated doctoral students and those with permission of instructor. A course intended to meet the needs of students who desire to carry on individual investigation.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may be repeated for additional credit.

EDUC 9287. Practicum Corr Remed. 3 Credit Hours.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may be repeated for additional credit.

EDUC 9288. Instr. Pract: Corr/Remed. 3 Credit Hours.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may be repeated for additional credit.

EDUC 9289. Fldwork Disabilities Sty. 1 to 6 Credit Hour.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may be repeated for additional credit.

EDUC 9487. Pract: Program Supv. 3 Credit Hours.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may be repeated for additional credit.

EDUC 9489. Field Exp & Practicum. 3 to 6 Credit Hours.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may be repeated for additional credit.

EDUC 9587. Prac Intro to Diagnosis. 3 Credit Hours.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may be repeated for additional credit.

EDUC 9991. Research Apprenticeship. 1 to 3 Credit Hour.
Working under the close mentorship of a faculty member, students actively engage in research and produce a scholarly product such as a submission to an academic conference, an article or chapter or a grant proposal.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Repeatability: This course may be repeated for additional credit.
EDUC 9993. Master’s Comprehensive Examination. 1 to 6 Credit Hour.
This course is for the Master’s comprehensive examination in the College of Education. You should register for the section specific to your advisor.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
College Restrictions: Must be enrolled in one of the following Colleges: Education.

Repeatability: This course may be repeated for additional credit.

EDUC 9994. Preliminary Examination Preparation. 1 to 6 Credit Hour.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

EDUC 9996. Thesis Credits: Masters. 1 to 6 Credit Hour.
Students complete a thesis or project under the supervision of their advisor.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

EDUC 9998. Dissertation Proposal Design. 1 to 3 Credit Hour.
Proposal writing. Limited to those who have passed the Preliminary Exams. Repeatable.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

EDUC 9999. Doctor of Education Dissertation. 1 to 6 Credit Hour.
Dissertation research. Limited to those elevated to candidacy/class 9.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Student Attribute Restrictions: Must be enrolled in one of the following Student Attributes: Dissertation Writing Student.

Repeatability: This course may be repeated for additional credit.