DOCTOR OF PHILOSOPHY (Ph.D.), MAJOR IN MATHEMATICS EDUCATION

Ph.D. Programs

Offered through the Department of Mathematics at Texas State, this program has a particular strength in the number of courses required in mathematics to complement courses in the teaching and learning of mathematics. Doctoral graduates will have completed a substantial mathematics core in addition to the mathematics education core, thus opening a wide variety of employment opportunities.

This program is designed for people whose career goals will take them into professional leadership roles involving mathematics education within the United States or internationally. Graduates of the program will be prepared for positions as mathematicians or mathematics-education faculty in colleges and universities; as decision makers in state or local education agencies; as researchers in think tanks, corporations, or not-for-profit organizations; as high-ranking staff in foundations or international organizations; or decision-makers within a national ministry of education.

Students beginning the program are expected to have an undergraduate degree in mathematics, mathematics education, or a related field. Students, especially those with a degree in a related field other than mathematics or mathematics education, may need to take background leveling courses. This would be decided on a case by case basis by the appropriate advisor and would be articulated at the time of admission.

Educational Goal

The educational objectives of the program in mathematics education are:

• To develop a well-balanced foundation in mathematics content including in-depth understanding of basic principles.
• To understand the mathematics needed for our rapidly changing technological society.
• To link mathematics content to pedagogy for effective teaching that addresses educational needs through the entire P-20 continuum.
• To understand how to design best and most effective curriculum and ways to deliver this curriculum.
• To contribute to the knowledge in mathematics education by original research.
• To produce Ph.D. graduates who can become the leaders in the state and the nation’s educational community concerning the teaching of mathematics appropriate for the demands of the 21st century.
• To produce high-quality teachers of mathematics at all levels.

Teaching Experience

Each student in the mathematics education program is expected to have two years teaching experience. A student who has taught for two or more years at full-time status in the public school system will be considered to have met this requirement. A student who has not met this requirement upon admission will be required to gain practical teaching experience before graduation. If a student receives a teaching assistantship while in the program, each long term during which the student has a two-course assignment will count as one half of a year of experience. A student who teaches two summer sessions will be given credit for one long semester. In the event that a student has other forms of practical teaching experience, the mathematics education advisor will determine the amount of credit received on an individual basis.

Admission Policy

For information regarding admission application requirements and deadlines, please visit The Graduate College website at http://www.gradcollege.txstate.edu/mathed.html.

Financial Assistance

Almost all doctoral students are expected to receive full financial assistance from the department working as instructional assistants or research assistants. You must be accepted as a Ph.D. student in order to apply. In addition, you much submit to the department:

• a completed employment application form which can be downloaded from the departmental web site;
• at least one letter of recommendation on your ability to teach, which could be one of the three letters you sent for your admission;
• a current vita.

Please visit the departmental website for more detailed information. The financial aid application deadline is the same as that for graduate admission. Note that only a very limited number of positions are available for spring semesters. Stipends for research assistantships depend on the types of research grants. Additional summer support is available as instructional assistants or research assistants. Contact the department for more information.

In addition to the financial aid from the Department of Mathematics, The Graduate College offers a wide variety of graduate assistantships and scholarships, including Texas State Celebrity Classic Scholarships, Texas State Graduate Scholars Program, and College Graduate Scholarships. For more details and how to apply, visit the Department of Mathematics website http://www.math.txstate.edu/ or The Graduate College website http://www.gradcollege.txstate.edu/. Please note that the deadlines for these and other scholarships may be different from those for instructional assistants of mathematics.

Course Work

Semester Hour Requirements

The student must complete 60 semester hours of graduate work to meet the minimum requirements for advancement to candidacy and then a minimum of 18 hours of dissertation courses to complete the degree for a minimum of 78 hours. In some cases, a student may need to complete additional hours before being allowed to advance to candidacy. The student must have satisfied the residency requirement of 18 graduate credit hours.

Degree Audit

Each Ph.D. student is issued a preliminary degree audit by The Graduate College which should be used to plan the student’s course of study. In the first term of enrollment, students should review the degree audit in consultation with their supervising professor and the program director. Doctoral degree audits are tailored with the individual student in mind. It is therefore possible for the individual degree audit to exceed the number of degree hours identified in the catalog.

Course Work Requirements

Each student is required to pass 36 hours of core courses, a minimum of 24 hours of elective courses, and a minimum of 18 hours of dissertation,
yields a minimum of 78 hours in course work. No grade earned below a "B" on any graduate course may apply toward a Ph.D. at Texas State. However, a student's doctoral program requirements may be modified as a result of a change to their research goals or performance in the qualifying exams.

The doctoral candidacy requirements include:

1. Completion of all required course work with the exception of dissertation credit hours.
2. Successful passage of all three qualifying exams.
3. Successful passage of the comprehensive exam.
4. Approval of the dissertation proposal.
5. At least a 3.5 GPA on all doctoral required courses.

Qualifying Examination

Typically, after completion of the core courses or by the end of the second year in residence, each student will be required to take written qualifying examinations. To be eligible to take the qualifying examinations, the student normally will have a minimum grade point average of 3.5 on all the core courses including the transferred equivalent courses that the student has completed. A student will choose two of the following topics to be on his or her qualifying examinations: algebra, analysis, topology, statistics, and discrete mathematics. Mathematics education will be the third topic.

Qualifying Examination

Select a minimum of 18 hours from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 7199A</td>
<td>Dissertation in Mathematics Education</td>
<td>18</td>
</tr>
<tr>
<td>MATH 7299A</td>
<td>Dissertation in Mathematics Education</td>
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<tr>
<td>MATH 7399A</td>
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<tr>
<td>MATH 7999A</td>
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<td></td>
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</tbody>
</table>

Total Hours: 78

1 A student may elect, with approval of the student's dissertation advisor, three hours from other departments in addition to the courses listed here. Note that topics-courses may be repeated provided the topics differ. Students' choice of courses must be approved by the graduate advisor.

Comprehensive Examination

A comprehensive oral examination of the student’s dissertation proposal will take place as part of the proposal defense.

Advancement to Candidacy

Application for Advancement to Candidacy

The dean of The Graduate College approves advancement to candidacy once all requirements are met. Doctoral students must be advanced to candidacy within five years of initiating Ph.D. course work. The university will notify the student of their advancement to candidacy. The dean of the Graduate College will order the examination to take place as part of the proposal defense.

Comprehensive Examination

Following the successful completion of all qualifying exams, a student may register for a maximum of three of the required eighteen dissertation credits until successful defense of the dissertation proposal.

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Advancement to Candidacy Time Limit
No credit will be applied toward the doctoral degree for course work completed more than five years before the date on which the student is advanced to candidacy. This time limit applies toward credit earned at Texas State as well as credit transferred to Texas State from other accredited institutions.

Requests for a time extension must be submitted to the doctoral program director, who in turn, submits a recommendation to the dean of The Graduate College.

Grade-Point Requirements for Advancement to Candidacy
To be eligible for advancement to candidacy, the student must have a minimum GPA of 3.5. No grade earned below a "B" on any graduate course may apply toward a Ph.D. at Texas State.

Incomplete grades must be cleared through the office of The Graduate College before a student can be approved for advancement to candidacy.

Dissertation Proposal
In order to be advanced to candidacy, a student must select a doctoral dissertation advisor and committee, submit a dissertation proposal, and successfully defend the proposal in an oral examination with the dissertation committee. The examination will address the problem definition and scope, the relevant literature, and the research method of the proposed dissertation topic. Information about the formation of the dissertation committee can be found in the "Dissertation Research and Writing" section of this catalog.

Recommendation for Advancement to Candidacy
The doctoral program committee recommends the applicant for advancement to candidacy to the doctoral program director, the department chair, and the dean of The Graduate College. The dean of The Graduate College certifies the applicant for advancement to candidacy once all requirements have been met. To be eligible for admission to candidacy, the student must have successfully completed the qualifying and/or comprehensive exam(s), completed all course work, and successfully defended the dissertation proposal.

Dissertation Research and Writing
All doctoral students are required to complete a dissertation. The dissertation must be an original contribution to scholarship and the result of independent investigation in a significant area. Preparation of the dissertation must follow the latest edition of Kate L. Turabian's *A Manual for Writers*.

Dissertation Enrollment Requirements
Enrollment
After being admitted to candidacy, students must be continuously enrolled each term for at least three dissertation hours. If a student is receiving supervision on the dissertation during the summer or the student is graduating during the summer, the student must be enrolled in dissertation hours for the summer. All candidates for graduation must be enrolled in dissertation hours during the term in which the degree is to be conferred.

Hours
Students must complete a minimum of 18 semester hours of dissertation research and writing credit.

Dissertation Time Limit
Students are expected to complete the dissertation within three years of advancement to candidacy. The mathematics education program director will review the students' annual progress to ascertain his or her progress in pursuing the degree. The program director will consult with the student's Ph.D. advisor and dissertation committee on this matter as appropriate.

Dissertation Committee
A dissertation committee must be formed to oversee the research and writing of the dissertation. The dissertation committee will include a dissertation advisor and a minimum of three additional members (one of whom must be an external member).

The members must be chosen from qualified Ph.D. faculty. The dissertation advisor and the committee members must be selected in consultation with the student. The dissertation advisor will chair the dissertation committee and must be from the major department. The dissertation advisor and committee members must be approved by the doctoral program director, the department chair, and the dean of The Graduate College.

The student is responsible for obtaining committee members' signatures on the proper forms and submitting the forms to the department for further routing approval. The forms may be downloaded from The Graduate College website.

Committee Changes
Any changes to the dissertation committee must be submitted for approval to the dissertation committee chair, the doctoral program director, the department chair, and the dean of The Graduate College. Changes must be submitted no less than sixty days before the dissertation defense. The "Ph.D. Research Advisor/Committee Member Change Request form" may be downloaded from The Graduate College website.

Dissertation Defense
The dissertation defense may not be scheduled until all other academic and program requirements have been fulfilled. A complete draft of the dissertation must be given to the members of the dissertation committee at least 65 days before the date of commencement during the term in which the student intends to graduate. After committee members have reviewed the draft with the student and provided comments, the student, in consultation with the research advisor, will incorporate the recommended changes into a second draft of the dissertation. When each committee member is satisfied that the draft dissertation is defendable, dissertation defense will be scheduled.

The dissertation defense will consist of two parts. The first part is an oral presentation of the dissertation research given as a public seminar. The second part of the defense will immediately follow the public presentation, but is restricted to the student's dissertation committee, and will entail an oral examination over the dissertation research. The full committee, including all external members, must be present. Approval of the dissertation requires positive votes from the student's Ph.D. advisor and a majority of the remaining members of the dissertation committee.
Specific information on the examination and defense procedure can be obtained from the doctoral program director.

Approval and Submission of the Dissertation

Following approval and signing of the dissertation by the members of the dissertation committee, the student must submit one copy of the dissertation and one signed "Thesis/Dissertation Committee Approval form" to The Graduate College for final approval. Specific guidelines for approval and submission of the dissertation can be obtained from the office of The Graduate College. Dissertations must be submitted in electronic format.

Fee Reduction

A master's or doctoral degree candidate for graduation may be eligible for a one-time fee reduction under V.T.C.A. Education Code, Section 54.054. Please refer to the section titled Fee Reduction in the Additional Fees and Expenses chapter of this catalog for more information.

Doctoral level courses in Mathematics Education: ED (p. 4), MATH (p. 10)

Courses Offered

Education (ED)

ED 7111. Collaborative Inquiry Project, Phase I: Field-Based Assessment.
This course involves the selection of a problem for study in the field. Students will gather and analyze needs assessment data and design an action plan for field-based research.
Course Attribute(s): Dual Enrollment Permitted/Time Conflicts Permitted
Grade Mode: Standard Letter
about Collaborative Inquiry Project, Phase I: Field-Based Assessment
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.

ED 7112. Collaborative Inquiry Project, Phase II: Field-Based Implementation.
This course requires students to implement an action plan to solve a problem in the field that has been selected in ED 7111. Prerequisite: ED 7111 or instructor's permission.
Course Attribute(s): Dual Enrollment Permitted/Time Conflicts Permitted
Grade Mode: Standard Letter
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.

This course involves the collection and analysis of data as part of a field-based action research project. Students will gather, analyze, and interpret a variety of data and prepare a written report on a field-based research project. Prerequisites: ED 7111, ED 7112 or instructor’s permission.
Course Attribute(s): Dual Enrollment Permitted/Time Conflicts Permitted
Grade Mode: Standard Letter
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.

ED 7199A. Dissertation in Education-Adult, Professional, and Community Education.
Original research and writing in Education-Adult, Professional and Community Education, to be accomplished under direct supervision on the dissertation advisor. While conducting dissertation research and writing, students must be continuously enrolled. Graded on a credit (CR), no-credit (F) basis.
Grade Mode: Credit/No Credit
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.

ED 7199B. Dissertation in Education-School Improvement.
Original research and writing in Education-School Improvement, to be accomplished under direct supervision of the dissertation advisor. While conducting dissertation research and writing, students must be continuously enrolled. Graded on a credit (CR), no-credit (F) basis.
Grade Mode: Credit/No Credit
2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.

ED 7299A. Dissertation in Education-Adult, Professional, and Community Education.
Original research and writing in Education-Adult, Professional and Community Education, to be accomplished under direct supervision of the dissertation advisor. Students must be continuously enrolled. Graded on a credit (CR), no-credit (F) basis.
Grade Mode: Credit/No Credit
2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.

ED 7299B. Dissertation in Education-School Improvement.
Original research and writing in Education-School Improvement, to be accomplished under direct supervision of the dissertation advisor. Students must be continuously enrolled. Graded on a credit (CR), no-credit (F) basis.
Grade Mode: Credit/No Credit
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

ED 7310. Instructional Roles in Counseling, Leadership, Adult Education & School Psychology.
This seminar is intended to prepare graduate teaching and instructional assistants in the CLAS Department to function effectively in various instructional and instructional support roles. Required for first-year teaching assistants and GIAs. This course does not earn graduate degree credit. Repeatable with different emphasis.
Course Attribute(s): Graduate Assistantship|Exclude from Graduate GPA
Grade Mode: Leveling/Assistantships
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
ED 7311. Educational Philosophy in a Social Context.
This course examines the philosophical foundations of education from the time of Plato through current writings. It frames these foundations through the lens of educational challenges of today. Readings include classical and current writings.

about Educational Philosophy in a Social Context

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7312. Leadership and Organizational Change.
This course will familiarize students with different perspectives on organizations, different paradigms by which they might be viewed, and a survey of research done on organizations, organizational leadership and change.

about Leadership and Organizational Change

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7313. Advanced Studies in Adult Learning and Development.
This advanced seminar will examine research and theoretical literature on a variety of topics including: characteristics of adult learners; models of adult cognitive and psychosocial development; adult cognition, memory, and intelligence; and principles for facilitating adult learning. Restricted to Ph.D. in Education degree, Major in School Improvement.

about Advanced Studies in Adult Learning and Development

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7314. Community Development for Educators.
Examines models and methods of community development as relevant to the practice and scholarship of formal and non-formal education.

about Community Development for Educators

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

This course examines the philosophies informing different research epistemologies, and examples of how these can be actualized methodologically. Philosophies to be analyzed include feminism, and race-based theory. This course will help students see the multiple possibilities for conducting research.

about Models of Inquiry: Understanding Epistemologies

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7316. Advanced Studies in Adult Development.
This course examines current theories of adult development, fundamental developmental changes in adulthood, and the implications for practice in adult education. Restricted to students admitted to the Education Ph.D. Program – APCE major or with permission of instructor.

about Advanced Studies in Adult Development

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7318. Advanced Studies in Adult Learning.
This advanced seminar will examine research and theoretical literature on a variety of topics related to adult learning such as: characteristics and diversity of adult learners; key theories of adult learning; alternative perspectives on adult learning; intelligence, aging and wisdom; and learning in the digital age. Restricted to students admitted to the Education Ph.D. Program – APCE major or with permission of instructor.

about Advanced Studies in Adult Learning

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7320. Literature Review for Research Writing.
In this seminar course, students conduct a careful examination of a body of literature related to a research topic in adult/professional/community/lifelong education. The literature review tests research questions in relation to what is published about a topic, discusses various positions, crafts coherent arguments and addresses knowledge gaps. Prerequisites: ED 7352 or ED 7351. Restriction: Doctoral standing.

about Literature Review for Research Writing

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7321. Historical and Philosophical Foundations and Contemporary Issues in Adult Education.
Examines historical and philosophical foundations for the study and practice of adult professional, and community education in formal and non-formal settings; and contemporary issues in adult education in a "learning society." Prerequisites: Core courses or instructor's permission.

about Historical and Philosophical Foundations and Contemporary Issues in Adult Education

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

Examines the methods, practices, and issues of facilitating learning related to occupational, professional, and volunteer roles. Prerequisites: Core courses or instructor's permission.

about Human Resource and Professional Development

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7323. Community/Organizational Leadership and Management.
Examines issues and strategies related to the operation and delivery of educational programs in post-secondary, adult, and community settings. Prerequisites: Core courses or instructor's permission.

about Community/Organizational Leadership and Management

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7324. Community/Organizational Leadership and Management.
Examines issues and strategies related to the operation and delivery of educational programs in post-secondary, adult, and community settings. Prerequisites: Core courses or instructor's permission.

about Community/Organizational Leadership and Management

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
ED 7324. Problems and Strategies in Program Planning Seminar.
Addresses principles and procedures, issues and trends, utilization of assessment, goal setting, and other effective strategies for developing learning opportunities and programs responsive to human, professional, and community needs. Prerequisites: Core courses or instructor's permission.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7326. Theoretical Foundations of Educational Policy, Politics and Practice.
This course examines the historical and theoretical underpinnings informing educational policy, politics and social justice. It addresses both the micro and macro levels of the context, values, and cultural norms guiding policy and practice in a democratic society. Prerequisites: ED 7311, ED 7312, and ED 7313.
about Theoretical Foundations of Educational Policy, Politics and Practice
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7327. Education Policy Development.
This course equips students with the skills needed to analyze the origins and consequences of existing policy and to play active roles in policy development for educational equity and social justice. Prerequisite: ED 7326.
about Education Policy Development
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7328. Research and Analysis in Education Policy.
This course engages students in a field-based educational policy research project using quantitative and qualitative techniques. Students will develop their skills to identify policy issues, gather and analyze data, and draw conclusions, and disseminate findings. Prerequisites: ED 7326, ED 7327, ED 7351, and ED 7352.
about Research and Analysis in Education Policy
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7329. Field-Based Experience in Educational Policy.
This course provides fieldbased practice in policy analysis and development from a democratic and social justice perspective. With guidance from a university faculty supervisor and site mentor, the student will develop and implement a policy project related to democracy and social justice. Prerequisite: ED 7328.
about Field-Based Experience in Educational Policy
3 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7331. Foundations of School Improvement.
Examines school improvement efforts from philosophical, political, psychological, cultural, ethical, and technological foundations. Prerequisites: Core courses or instructor's permission.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7332. Facilitating School Improvement.
Examines school culture, schools as learning communities, the change process, and research-based school improvement models, with experiential applications. Prerequisites: Core courses or instructor’s permission.
about Facilitating School Improvement
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7333. Curriculum and Instructional Leadership.
Examines the relationship between curriculum, instructional improvement, and teacher development, with experiential applications.
about Curriculum and Instructional Leadership
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7334. Models of Educational Assessment.
Includes assessment of student learning at the individual, classroom, school, and system level; teacher assessment; and program assessment.
about Models of Educational Assessment
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

In this course students approaching dissertation stage meet in a seminar designed to help them clarify their research problem and develop a preliminary proposal for the dissertation. Core and concentration courses must be completed with minimum grades of "B" in each course prior to taking ED 7341. Prerequisites: ED 7351, ED 7352, and ED 7353 or ED 7354 with minimum grades of "B". Departmental approval required.
about Dissertation Proposal Development
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7345. Human Resources and Instructional Management.
This course focuses on the twin areas of human resource administration and instructional improvement. Topics addressed include legal requirements for personnel management, staff supervision, appraisal, and development, curriculum planning and alignment and student assessment. Students taking the course will complete an original research project under the instructor's direction.
about Human Resources and Instructional Management
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
ED 7347. The Superintendency.
This course addressed issues critical to superintendents in Texas. These include leadership, leadership assessment, school board relations, and other governance issues, management strategies, the role of public education in a democratic society, and professional ethics. Students taking the course will complete an original research project under the instructor’s direction.
Grade Mode: Standard Letter
about The Superintendency
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

ED 7349. School Finance and Business Management.
This course focuses on the financing of public schools. Students will examine the school budgeting process, sources of school revenues, principals of taxation, methods of school fund accounting, and techniques of business management. Students taking the course will complete an original research project under the instructor’s direction.
about School Finance and Business Management
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7350. Methods of Research in Education.
This course provides an introduction to the design and analysis of quantitative and qualitative research in education. Topics included are quantitative research design, measurement, and statistical analysis. From a qualitative perspective, the course provides an introduction to the various qualitative modes of inquiry relevant to education.
about Methods of Research in Education
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7351. Beginning Quantitative Research Design and Analysis.
Includes descriptive statistics; sampling techniques; statistical inference including the null hypothesis, significance tests, and confidence intervals; and causal-comparative analyses, including t-test and ANOVA. Prerequisites: Core and Concentration courses or instructor’s permission.
about Beginning Quantitative Research Design and Analysis
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Beginning Quantitative Research Design and Analysis

ED 7352. Beginning Qualitative Design and Analysis.
Introduces the qualitative paradigm. Includes distinctive features, alternative qualitative traditions, purposeful sampling, common data collection methods, inductive analysis, the role of the researcher, and evaluating qualitative research. Prerequisites: Core and Concentration courses or instructor’s permission.
about Beginning Qualitative Design and Analysis
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Beginning Qualitative Design and Analysis

This course focuses on issues in the design and implementation of quantitative research. Topics include ANOVA, ANCOVA, and MANOVA, correlation analysis, regression analysis, nonparametric tests, and relationships between experimental designs and statistical analysis techniques. Prerequisite: ED 7351 with a minimum grade of "B", or instructor’s permission.
about Intermediate Quantitative Research Design and Analysis
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Intermediate Quantitative Research Design and Analysis

ED 7354. Intermediate Qualitative Design and Analysis.
Focuses on issues in design and implementation of qualitative research. Topics include influence of alternative traditions, literature in qualitative research, access to the field and ethical issues, researcher-participant relationships, purposeful sampling strategies, inductive analysis procedures, developing theory, and reporting research. Prerequisite: ED 7352 with a minimum grade of "B", or instructor’s permission.
about Intermediate Qualitative Design and Analysis
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Intermediate Qualitative Design and Analysis

ED 7355. Non-Parametric Research Design and Analysis.
This course is designed to address problems in education in situations where the sample size collected is small, categorical in nature, of non-parametric research design and statistical methods are covered in detail.
about Non-Parametric Research Design and Analysis
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Non-Parametric Research Design and Analysis

ED 7357. Advanced Study in Action Research.
This course examines underlying theory, practice, skills, and issues in action research. Conducting research in the area of action research is also addressed. This course is an appropriate elective for majors in School Improvement or Adult, Professional and Community Education.
about Advanced Study in Action Research
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Advanced Study in Action Research

ED 7358. Theoretical and Conceptual Frameworks in Qualitative Research.
Advanced study in the historical, philosophical, conceptual, and theoretical underpinnings of qualitative research.
about Theoretical and Conceptual Frameworks in Qualitative Research
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Theoretical and Conceptual Frameworks in Qualitative Research
ED 7359. Seminar in Quantitative Research.
This course is a small group seminar that focuses on analytic strategies specific to the doctoral student’s dissertation topic. Examples include structural equation modeling, hierarchical linear modeling, log linear modeling, non-parametric analyses, factor analysis, factorial analysis of variance, and other multivariate statistical methods. Prerequisites: ED 7351 and ED 7353 with minimum grades of "B" in each course.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Seminar in Quantitative Research

ED 7361. Understanding People: Professional Development.
Fundamental issues related to development of personnel. Knowledge of staff appraisal, adult learning and development, and staff development. Focus on professional development in K-12 schools.

about Understanding People: Professional Development
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Understanding People: Professional Development

ED 7362. Supervision of Instruction.
Concepts of curriculum and instructional models for schools will be developed. Factors such as curriculum leadership and instructional improvement are considered as part of the internal environment. An emphasis will be placed on supervision knowledge, skills, and tasks.

about Supervision of Instruction
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Supervision of Instruction

ED 7363. Curriculum Design.
Theory and practice in planning for curriculum needs assessment, development, implementation, and evaluation. Focus on K-12 school curricula. Students who have completed EDA 6342 may not take this course for doctoral credit.

about Curriculum Design
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Curriculum Design

ED 7364. Team Development in Education.
This course addresses the development and use of educational teams to improve educational organizations, teaching, and learning. Because of its focus on education, it is recommended only for doctoral students preparing for careers in educational settings.

about Team Development in Education
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Team Development in Education

ED 7365. Cross-cultural Leadership in Education.
Students will work as a team to undertake a research study of leadership across cultures in the U.S. and Mexico. Students must be accepted in the Education Ph.D. program. Fluency in Spanish is preferred.

about Cross-cultural Leadership in Education
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Multicultural Content
Grade Mode: Standard Letter
about Cross-cultural Leadership in Education

ED 7371. Anthropology and Education.
This course introduces the student to the basic concepts in anthropology and education and sketches the application of these concepts. It explores the research in anthropology and education with relevance to both K-12 schools and other, more general educational settings. The course is an appropriate elective for Education Ph.D. majors.

about Anthropology and Education
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Anthropology and Education

ED 7372. The Emotions of Leading, Teaching, and Learning.
This course offers an introduction to theories of emotion, leading, teaching, and learning as interconnected fields. Students in this course will achieve a theoretical grounding that will deepen their understandings of the relationship of emotion to all of these important human endeavors. This course will be of interest of practitioners, researchers, and/or theorists.

about The Emotions of Leading, Teaching, and Learning
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about The Emotions of Leading, Teaching, and Learning

ED 7378. Problems in Education.
Individual problems or topics will be designed and completed to emphasize selected areas of study. May be repeated for additional credit at the discretion of the program coordinator.

about Problems in Education
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dual Enrollment Permitted
Grade Mode: Standard Letter
about Problems in Education

ED 7379. Independent Study.
Individual problems or topics will be designed and completed to emphasize selected areas of study in the Counseling, Leadership, Adult Education & School Psychology Department. May be repeated for additional credit at the discretion of the program coordinator.

about Independent Study
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Independent Study

ED 7389A. Theological Issues in Education.
This course focuses on theological issues in education. Informed by the disciplinary structures of curriculum theory, this seminar course convokes a community of scholars and practitioners in thoughtful dialogue and study that takes up questions of spiritual, moral, and theological issues within education in a pluralistic society.

about Theological Issues in Education
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Theological Issues in Education
ED 7389B. Seminar in International Educational Research: Chile.
This course develops theoretical knowledge, methodological skills, and scholarly capacity for international educational research. It focuses on research within the complex educational environment of Chile, involving seminar components held at the university and research fieldwork in Chile. International research is framed as a form of service learning. Restricted to students in the PhD in Education program. (about Seminar in International Educational Research: Chile)
3 Credit Hours. 2 Lecture Contact Hours. 1 Lab Contact Hour.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter

ED 7389C. Advanced Theory in Qualitative Research.
The purpose of this course is to explore the possibilities of narrative research. The course is divided into three sections: 1) the details of scale development; 2) details of sample selection and survey delivery systems, and 3) data analysis, writing, and presenting results effectively. Restricted to masters' and doctoral students. (about Advanced Theory in Qualitative Research: Narrative Research)
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter

ED 7389D. Advanced Theory in Qualitative Research: Narrative Research.
The course features advanced study in qualitative research methods. The course studies such methods as ethnography, case study, phenomenology, narrative analysis, post-qualitative research, grounded theory, or more advanced qualitative research in general and their constitutive field techniques. Prerequisites: Introduction to Qualitative Research and Intermediate Qualitative Research. (about Advanced Theory in Qualitative Research: Narrative Research)
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter

ED 7389E. Mexican Perspectives on Mexico - U.S. Immigration.
The course gives U.S. educators an understanding of Mexican to U.S. immigration from Mexican women's perspectives. Students will read background information and visit Mexico where through lectures, field interviews, and field visits, they will view immigration from the "other side". They will analyze and write up data when they return. (about Mexican Perspectives on Mexico - U.S. Immigration)
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter

ED 7389G. Adult Learners in Higher Education.
This course examines adult academic learning, instruction, and the particular challenges adults face balancing multiple life demands and often studying in a system established to meet the needs of younger students. Course may not be repeated. Maximum 3 credit hours. (about Adult Learners in Higher Education)
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter

ED 7389L. Writing for Publication.
Students will hone their writing skills. Students will work individually and in groups, getting feedback from other students and the instructor. Topics include APA style, getting started, first drafts, polishing and tightening, re-writing, submitting a manuscript, responding to feedback/ reviews and more. Restricted to masters' and doctoral students. (about Writing for Publication)
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter

ED 7390. Survey Research and Scale Development.
This course provides the technical information necessary to design and conduct a quantitative or mixed-method survey research project. The course is divided into three sections: 1) the details of scale development; 2) details of sample selection and survey delivery systems, and 3) data analysis, writing, and presenting results effectively. (about Survey Research and Scale Development)
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dual Enrollment Permitted
Grade Mode: Credit/No Credit

ED 7399A. Dissertation.
Original research and writing in Adult, Professional, and Community Education, to be accomplished under direct supervision of the dissertation advisor. While conducting dissertation research and writing, students must be continuously enrolled each semester (including summer) for at least three dissertation hours. Graded on a credit (CR), progress (PR), no-credit (F) basis. (about Dissertation)
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dual Enrollment Permitted
Grade Mode: Credit/No Credit

ED 7399B. Dissertation.
Original research and writing in School Improvement, to be accomplished under direct supervision of the dissertation advisor. While conducting dissertation research and writing, students must be continuously enrolled each semester (including summer) for at least three dissertation hours. Graded on a credit (CR), progress (PR), no-credit (F) basis. (about Dissertation)
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dual Enrollment Permitted
Grade Mode: Credit/No Credit

ED 7399A. Dissertation - Adult, Professional and Community Education.
Original research and writing in Education-Adult, Professional and Community Education, to be accomplished under direct supervision on the dissertation advisor. While conducting dissertation research and writing, students must be continuously enrolled. Graded on a credit (CR), no-credit (F) basis. (about Dissertation - Adult, Professional and Community Education)
5 Credit Hours. 5 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

ED 7399B. Dissertation - Adult, Professional and Community Education.
Original research and writing in Education-Adult, Professional and Community Education, to be accomplished under direct supervision on the dissertation advisor. While conducting dissertation research and writing, students must be continuously enrolled. Graded on a credit (CR), no-credit (F) basis. (about Dissertation - Adult, Professional and Community Education)
5 Credit Hours. 5 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit
ED 7599B. Dissertation in Education - School Improvement.
Original research and writing in Education-School improvement, to be accomplished under direct supervision of the dissertation advisor. While conducting dissertation research and writing, students must be continuously enrolled. Graded on a credit (CR), no-credit (F) basis. about Dissertation in Education - School Improvement
5 Credit Hours. 5 Lecture Contact Hours. 0 Lab Contact Hours. Grade Mode: Credit/No Credit
about Dissertation in Education - School Improvement

ED 7699A. Dissertation.
The student conducts original research and writing in Adult, Professional, and Community Education, guided by the direct supervision of the dissertation chair. While conducting dissertation research and writing, students must be continuously enrolled. The course is graded on a credit (CR), progress (PR) or no-credit (F) basis. Prerequisites: Core, Concentration, and Methodology courses or instructor’s permission. about Dissertation
6 Credit Hours. 6 Lecture Contact Hours. 0 Lab Contact Hours. Grade Mode: Credit/No Credit
about Dissertation

ED 7699B. Dissertation.
Students produce a dissertation under direct supervision of dissertation advisor. While conducting dissertation research and writing, students must be continuously enrolled. This course is graded on a credit (CR), progress (PR), or no-credit (F) basis. Prerequisites: Core, Concentration, and Methodology courses or instructor’s permission. about Dissertation
6 Credit Hours. 6 Lecture Contact Hours. 0 Lab Contact Hours. Grade Mode: Credit/No Credit
about Dissertation

ED 7999A. Dissertation in Education - Adult, Professional and Community Education.
Original research and writing in Education-Adult, Professional and Community Education, to be accomplished under direct supervision on the dissertation advisor. While conducting dissertation research and writing, students must be continuously enrolled. Graded on a credit (CR), no-credit (F) basis. about Dissertation in Education - Adult, Professional and Community Education
9 Credit Hours. 9 Lecture Contact Hours. 0 Lab Contact Hours. Grade Mode: Credit/No Credit
about Dissertation in Education - Adult, Professional and Community Education

ED 7999B. Dissertation in Education - School Improvement.
Original research and writing in Education-School Improvement, to be accomplished under direct supervision of the dissertation advisor. While conducting dissertation research and writing, students must be continuously enrolled. Graded on a credit (CR), no-credit (F) basis. about Dissertation in Education - School Improvement
9 Credit Hours. 9 Lecture Contact Hours. 0 Lab Contact Hours. Grade Mode: Credit/No Credit
about Dissertation in Education - School Improvement

Mathematics (MATH)
MATH 7111. Seminar in Teaching.
Seminar on individual study projects concerned with selected problems in the teaching of mathematics. This course does not count for degree credit. Graded on a credit (CR), no-credit (F) basis. about Seminar in Teaching
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours. Course Attribute(s): Graduate Assistantship|Exclude from Graduate GPA
Grade Mode: Standard Letter
about Seminar in Mathematics

MATH 7187. Seminar in Mathematics Education.
Students are required to attend weekly research seminars in mathematics and to give at least one research presentation in the seminar during the semester. This course is repeatable for credit. about Seminar in Mathematics Education
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours. Grade Mode: Standard Letter
about Seminar in Mathematics Education

MATH 7188. Seminar in Mathematics Education.
Students are required to attend weekly research seminars in Mathematics Education and to give at least one research presentation in the seminar during the semester. This course is repeatable for credit. about Seminar in Mathematics Education
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours. Grade Mode: Credit/No Credit
about Seminar in Mathematics Education

MATH 7199A. Dissertation in Mathematics Education.
Original research and writing in Mathematics Education to be accomplished under direct supervision of the dissertation advisor. While conducting dissertation research and writing, students must be continuously enrolled each long semester. Graded on a credit (CR), no-credit (F) basis. about Dissertation in Mathematics Education
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours. Grade Mode: Leveling/Assistantships
about Dissertation in Mathematics Education

MATH 7299A. Dissertation in Mathematics Education.
This course represents a Mathematics Education student’s dissertation enrollments. The course can be repeated as necessary. The dissertation credit (18 hours) will not be awarded until the dissertation is submitted for binding. Prerequisite: completion of the core and required concentration courses, or approval of student’s dissertation advisor. about Dissertation in Mathematics Education
2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours. Grade Mode: Credit/No Credit
about Dissertation in Mathematics Education

MATH 7301. Studies in Mathematics.
This course provides basic foundations in Mathematics for students entering the doctoral program in Mathematics Education. This course may be repeated, but the course does not earn graduate degree credit and cannot be used for degree credit. about Studies in Mathematics
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours. Course Attribute(s): Exclude from Graduate GPA|Leveling
Grade Mode: Leveling/Assistantships
about Studies in Mathematics
MATH 7302. History of Mathematics.
A study of the development of mathematics and of the accomplishments of men and women who contributed to its progress.
Grade Mode: Standard Letter
about History of Mathematics
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

MATH 7303. Analysis I.
This course covers foundations of modern analysis. Topics include: sequences, LimSup, LImInf, Sigma Algebras of sets that include open and closed sets, sequences of functions, pointwise and uniform convergence, lower and upper semi-continuity, Borel sets, outer measure, and Lebesgue measure. Prerequisite: MATH 4315.
Grade Mode: Standard Letter
about Analysis I
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

MATH 7306. Current Research in Math Education.
This course surveys the various current social, political, and economic trends in local, state, national, and international settings that are related to research in Mathematics Education.
Grade Mode: Standard Letter
about Current Research in Math Education
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

MATH 7307. Algebra I.
Applications of Algebra and topics in modern algebra, including permutation groups, symmetry groups, Sylow theorems, and select topics from Ring Theory. Prerequisite: MATH 4307.
Grade Mode: Standard Letter
about Algebra I
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

MATH 7309. Topology I.
A course in point-set topology emphasizing topological spaces, continuous functions, connectedness, compactness, countability, separability, metrizability, CWcomplexes, simplicial complexes, nerves, and dimension theory. Prerequisite: MATH 4330.
Grade Mode: Standard Letter
about Topology I
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

MATH 7317. Algebra II.
A study of the important algebraic structures of rings and fields. Topics covered include rings, ideals, modules, polynomial rings, Euclidean algorithm, finite fields, and field extensions. Topics also include an introduction to Galois Theory with an emphasis on the geometric applications. Prerequisite: MATH 7307.
Grade Mode: Standard Letter
about Algebra II
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

MATH 7319. Topology II: Algebraic Topology.
This course covers the fundamental concepts and tools of algebraic topology. Topics include the fundamental group, covering spaces, homotopy type, the higher homotopy groups, singular homology theory, and the computation of homology groups via exact sequences and applications. Prerequisite: MATH 7307 and MATH 7309.
Grade Mode: Standard Letter
about Topology II: Algebraic Topology
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

MATH 7324. Curriculum Design & Analysis.
This course examines, analyzes, and evaluates the various concepts, topics, methods, and techniques that are related to curriculum design in Mathematics Education for grade levels P-16.
Grade Mode: Standard Letter
about Curriculum Design & Analysis
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

MATH 7325. Statistics 1.
A study of the mathematical and probabilistic underpinnings of the techniques used in statistical inference. Topics covered include sampling, sampling distributions, confidence intervals, and hypothesis testing with an emphasis on both simulations and derivations. Prerequisite: Math 2321, Math 3305.
Grade Mode: Standard Letter
about Statistics 1
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
MATH 7331. Combinatorics.  
This course is a study of fundamental principles of combinatorics. Topics include: permutations and combinations, the Pigeonhole principle, the principle of inclusion-exclusion, binomial and multinomial theorems, special counting sequences, partitions, posets, extremal set theory, generating functions, recurrence relations, and the Polya theory of counting. Prerequisite: MATH 3398. 

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
about Combinatorics

MATH 7335. Statistics II: Linear Modeling.  
A study of the formulation and statistical methodologies for fitting linear models. Topics include the general linear hypothesis, least-squares estimation, Gauss-Markov theorem, assessment of model fit, effects of departures from assumptions, model design, and criteria for selection of optimal regression models. Prerequisite: MATH 3377 and MATH 7325. 

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
about Statistics II: Linear Modeling

MATH 7346. Quantitative Research Analysis in Mathematics Education.  
This course surveys the various research techniques used in quantitative analysis for mathematics education and covers topics such as experimental design, statistical analysis, and use of appropriate design methodologies to achieve the strongest possible evidence to support or refute a knowledge claim. Prerequisite: MATH 7306 and MATH 7325. 

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
about Quantitative Research Analysis in Mathematics Education

MATH 7356A. Advanced Quantitative Research.  
This course encompasses investigation, development, and demonstration of competence, design, and execution for mathematics education problems in quantitative research. Prerequisite: MATH 7346. 

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Topics  
Grade Mode: Standard Letter  
about Advanced Quantitative Research

MATH 7356B. Advanced Qualitative Research.  
This course encompasses investigation, development, and demonstration of competence, design, and execution for mathematics education problems in qualitative research. Prerequisite: ED 7352. 

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Topics  
Grade Mode: Standard Letter  
about Advanced Qualitative Research

MATH 7356C. Action Research in Mathematics Education.  
This course examines underlying theory and issues in action research model and the development of action research projects. Prerequisites: MATH 7346 or ED 7352. 

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Topics  
Grade Mode: Standard Letter  
about Action Research in Mathematics Education

MATH 7361. Seminar in Advanced Mathematics.  
Material in course will vary with the interest of students and faculty. A detailed study of subject matter may be chosen from advanced areas of analysis; algebra; topology and geometry; applied mathematics; and probability and statistics. This course is repeatable for credit when subject matter varies. 

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
about Seminar in Advanced Mathematics

MATH 7366A. Teaching Post-Secondary Students (Developmental Math, Service Courses, and Majors).  
This course examines how to develop and teach post-secondary students. The course references the recommendations of government agencies and professional organizations and allows for the investigation of research-based models. Prerequisites: MATH 7306. 

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Topics  
Grade Mode: Standard Letter  
about Teaching Post-Secondary Students (Developmental Math, Service Courses, and Majors)

MATH 7366B. Teaching K-12 Students (Elementary, Middle School, and High School).  
This course examines how to develop and teach K-12 students. The course references the recommendations of government agencies and professional organizations and allows for the investigation of research-based models. Prerequisite: MATH 7306. 

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Topics  
Grade Mode: Standard Letter  
about Teaching K-12 Students (Elementary, Middle School, and High School)

MATH 7366C. Teaching Teachers (In-Service; Pre-Service).  
This course examines how to prepare teachers of mathematics. The course references the recommendations of government agencies and professional organizations and allows for the investigation of research-based models. Prerequisite: MATH 7306. 

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Topics  
Grade Mode: Standard Letter  
about Teaching Teachers (In-Service; Pre-Service)
MATH 7366D. Teaching Specialized Content.
This course will be an in-depth study of a specialized content area in mathematics with an emphasis on teaching. The specific content area will vary by instructor. Examples include Euclidean Simplex Geometry and Discrete Probability Spaces with Implications for Public School Curriculum.

Course Attributes: Topics
Grade Mode: Standard Letter

MATH 7366E. Developmental Mathematics Curriculum.
This course surveys the research, development, and evaluation of the scope and sequence of developmental mathematics curriculum. The course references the recommendations of government agencies and professional organizations and allows for the investigation of research-based models.

Course Attributes: Topics
Grade Mode: Standard Letter

MATH 7371A. Advanced Graph Theory.
Topics in this course include Turan’s problems, Ramsey theory, random graph theory, extremal graph theory, algebraic graph theory, domination of graphs, distance problems, and applications. Prerequisite: MATH 7321.

Course Attributes: Topics
grade: Standard Letter

MATH 7371B. Advanced Combinatorics.
Topics in this course include Block designs, Latin squares, combinatorial optimization problems, coding theory, matroids, difference sets, and finite geometry. Prerequisite: MATH 7331.

Course Attributes: Topics
Grade Mode: Standard Letter

MATH 7371C. Combinatorial Number Theory.
A study of fundamental techniques in combinatorial number theory. Topics will include Waring’s problem, additive number theory, and probabilistic methods in number theory. Prerequisite: MATH 7331.

Course Attributes: Topics
Grade Mode: Standard Letter

MATH 7371D. Discrete Optimization.
A study of some fundamental techniques in discrete optimization. Topics include discrete optimization, linear programming, integer programming, integer nonlinear programming, dynamic programming, location problem, scheduling problem, transportation problem, postman problem, traveling salesman problem, matroids, and NP-completeness. Prerequisites: MATH 7321 and 7331.

Course Attributes: Topics
Grade Mode: Standard Letter

MATH 7371E. Algorithms and Complexity.
A study of some fundamental concepts of computability and complexity. Topics include polynomially bounded problems, NP-complete problems, exponentially hard problems, undecidable problems, and reducibility. Prerequisite: MATH 7331.

Course Attributes: Topics
Grade Mode: Standard Letter

MATH 7371F. Probabilistic Methods in Discrete Mathematics.
A study of some fundamental probabilistic techniques used to solve problems in graph theory, combinatorics, combinatorial number theory, combinatorial geometry, and algorithm. Topics include linearity of expectation, alterations, second moment, local lemma, correlation inequalities, martingales, Poisson paradigm, and pseudo-randomness. Prerequisites: MATH 7321 and 7331.

Course Attributes: Topics
Grade Mode: Standard Letter

This course introduces fundamental concepts in logic, Boolean algebra, and binomial coefficients; and applications in different fields such as complexity of algorithms and network theory. Prerequisites: MATH 2472 and MATH 4307 with a grade of “C” or higher, or with departmental approval.

Course Attributes: Topics
Grade Mode: Standard Letter

MATH 7371H. Combinatorial Networks.
Combinatorial Networks is an area of study of certain types of networks using combinatorial methods extensively. This course introduces fundamental basics as well as the latest development in this area of research. Prerequisite: MATH 5307/7307 with a grade of “C” or higher.

Course Attributes: Topics
Grade Mode: Standard Letter
MATH 7375C. Time Series Analysis.
A study of the theory of time-dependent data. The analysis includes modeling, estimation, and testing; alternating between the time domain; using autoregressive and moving average models and the frequency domain; and using spectral analysis. Prerequisite: MATH 7335.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Time Series Analysis

MATH 7375D. Advanced linear Modeling.
The course provides an extension of regression methodology to more general settings where standard assumptions for ordinary least squares are violated. Topics include generalized least squares, robust regression, bootstrap, regression in the presence of autocorrelated errors, generalized linear models, and logistic and Poisson regression. Prerequisite: MATH 7335.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Advanced linear Modeling

MATH 7375E. Math Technologies.
This course examines the basic principles involved in mathematics education: Technology. This fundamental theme will be reviewed, researched, and discussed. Prerequisite: MATH 7306.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Math Technologies

MATH 7375F. Developmental Mathematics Perspectives.
This course examines developmental mathematics-specific strands including technological course support and placement tools/decisions. Issues related to the first mathematics core course required of undergraduates will also be addressed.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Developmental Mathematics Perspectives

MATH 7378A. Problem Solving, Reasoning, and Proof.
A study of the fundamental concepts of problem solving, logic, set theory, and mathematical proof and applications of these concepts in mathematics curriculum for grades P-20. Prerequisite: MATH 7306.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Problem Solving, Reasoning, and Proof

MATH 7378B. Connecting and Communicating Math.
This course examines one of the basic principles involved in mathematics education: Connecting and Communicating Mathematics. This fundamental theme will be reviewed, researched, and discussed. Prerequisite: MATH 7306.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Connecting and Communicating Math

MATH 7378C. Representing Fundamental Math Ideas (Function, Data Analysis, and Enumeration).
This course examines the basic principles involved in mathematics education. The process of representing fundamental mathematical ideas will be reviewed, researched, and discussed. Prerequisite: MATH 7306.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Representing Fundamental Math Ideas (Function, Data Analysis, and Enumeration)

MATH 7378D. Math Technologies.
This course examines the basic principles involved in mathematics education: Technology. This fundamental theme will be reviewed, researched, and discussed. Prerequisite: MATH 7306.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Math Technologies

MATH 7378E. Developmental Mathematics Perspectives.
This course examines developmental mathematics-specific strands including technological course support and placement tools/decisions. Issues related to the first mathematics core course required of undergraduates will also be addressed.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Developmental Mathematics Perspectives

MATH 7378F. Research on Mathematical Problem Solving in Secondary Schools.
In this course a careful study is made of elementary techniques for problem solving in a variety of domains, including algebra, number theory, combinatorics, geometry, and logic puzzles. Students will learn these techniques by actually working on a collection of problems in each of these areas. Students will read and examine research about various aspects of problem solving and research in math education that includes both teacher training and student learning.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter
about Research on Mathematical Problem Solving in Secondary Schools

MATH 7385. Independent Study in Mathematics.
Student will work directly with a faculty member and develop in-depth knowledge in a specific topic area of mathematics. Topics vary according to student’s needs and demands. Repeatable with different emphasis.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Independent Study in Mathematics

MATH 7386. Independent Study in Mathematics Education.
Student will work directly with a faculty member and develop in-depth knowledge in a specific topic area of Mathematics Education. Topics vary according to student’s needs and demands. Repeatable with different emphasis.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Independent Study in Mathematics Education
MATH 7389. Internship.
Students will work under the supervision of a faculty member to gain practical knowledge in Mathematics Education. Student experience can come from industry, government agencies, or other sources but must directly apply to furthering knowledge of mathematics education or its application.

Grade Mode: Standard Letter

3 Credit Hours. 0 Lecture Contact Hours. 10 Lab Contact Hours.

MATH 7396. Mathematics Education Research Seminar.
Collaborative research projects with faculty through identifying an educational issue, reviewing literature, creating a research question, designing a methodology, analyzing data, drawing conclusions, implications, and creating a draft of a publishable paper. Prerequisite: MATH 7356, and (ED 7352 or MATH 7346).

Grade Mode: Credit/No Credit

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

MATH 7399A. Dissertation in Mathematics Education.
This course represents a Mathematics Education student's dissertation enrollments. The course can be repeated as necessary. The dissertation credit (18 hours) will not be awarded until the dissertation is submitted for binding. Prerequisite: completion of the core and required concentration courses, or approval of student's dissertation advisor.

Grade Mode: Credit/No Credit

9 Credit Hours. 9 Lecture Contact Hours. 0 Lab Contact Hours.

MATH 7599A. Dissertation in Mathematics Education.
This course represents a Mathematics Education student's dissertation enrollments. The course can be repeated as necessary. The dissertation credit (18 hours) will not be awarded until the dissertation is submitted for binding. Prerequisite: completion of the core and required concentration courses, or approval of student's dissertation advisor.

Grade Mode: Credit/No Credit

5 Credit Hours. 5 Lecture Contact Hours. 0 Lab Contact Hours.

MATH 7699A. Dissertation in Mathematics Education.
This course represents a Mathematics Education student's dissertation enrollments. The course can be repeated as necessary. The dissertation credit (18 hours) will not be awarded until the dissertation is submitted for binding. Prerequisite: completion of the core and required concentration courses, or approval of student's dissertation advisor.

Grade Mode: Credit/No Credit

6 Credit Hours. 6 Lecture Contact Hours. 0 Lab Contact Hours.

MATH 7999A. Dissertation in Mathematics Education.
This course represents a Mathematics Education student's dissertation enrollments. The course can be repeated as necessary. The dissertation credit (18 hours) will not be awarded until the dissertation is submitted for binding. Prerequisite: completion of the core and required concentration courses, or approval of student's dissertation advisor.

Grade Mode: Credit/No Credit

9 Credit Hours. 9 Lecture Contact Hours. 0 Lab Contact Hours.