Program Overview

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

The program is for people whose career goals will take them into professional leadership roles involving mathematics education within the United States or internationally. This program prepares its graduates for positions as mathematics 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.

The ideal admittee has 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 decision will be made 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

The Mathematics Education Ph.D. program expects its students to have had two years of teaching experience. A student who has taught full-time in the public school system for two or more years meets 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 earns one long semester credit toward this requirement. If a student has other forms of practical teaching experience, the mathematics education advisor will determine the amount of credit received on an individual basis.

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 (available from the departmental web site);
- at least one letter of recommendation regarding teaching ability (this could be one of the three letters recommending admission to the program); and
- a current curriculum vitae.

Please visit the departmental website for more detailed information. The financial aid application deadline is the same as that for graduate admission. Note that the number of positions available for spring semesters is quite limited. 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. 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 assistantships in mathematics.

Advising

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, yielding 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, advisors may modify a student's doctoral program requirements as a result of either the student's performance in the qualifying exams or a change to their research goals.

The Graduate College issues each Ph.D. student a preliminary degree audit 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. Our advisors tailor doctoral degree audits with the individual student in mind. It is, therefore, possible for the individual degree audit to exceed the number of degree hours stated in the catalog.

Application Requirements

The items listed below are required for admission consideration for applicable semesters of entry during the current academic year. Submission instructions, additional details, and changes to admission requirements for semesters other than the current academic year can be found on The Graduate College's website (http://www.gradcollege.txstate.edu). International students should review the International Admission Documents page (http://mycatalog.txstate.edu/graduate/admission-documents/international/) for additional requirements.

- completed online application
- $55 nonrefundable application fee

   or

- $90 nonrefundable application fee for applications with international credentials
- baccalaureate degree or higher (or the equivalent thereof) in mathematics, mathematics education, or a related field from a regionally accredited university (Non-U.S. degrees must be equivalent to a four-year U.S. Bachelor's degree. In most cases, three-year degrees are not considered. Visit our International FAQs (https://www.gradcollege.txst.edu/international/faqs.html) for more information.)
- official transcripts from **each institution** where course credit was granted
- a 3.0 overall GPA or a 3.0 GPA in the last 60 hours of undergraduate course work (plus any completed graduate courses)
- GRE is not required
- interview with faculty
- resume/CV
- statement of purpose (500 words) describing the student's background and professional goals, including the rationale for pursuing a doctoral degree in mathematics education and teaching philosophy
- three letters of recommendation addressing the student's professional and academic background as well as research and teaching potential
- two years teaching experience: If student has taught for two or more years at full-time status in the public school system, they will be considered to have met this requirement. If the student has not met this requirement upon admission, they will be required to gain practical teaching experience before graduation. If the student receives a teaching assistantship while in the program, each long semester they have a two-course assignment will count as one half of a year of experience. If they teach two summer sessions, they will be given credit for one long semester. In the event that they have other forms of practical teaching experience, the Ph.D. program director will determine the amount of credit received on an individual basis.

Approved English Proficiency Exam Scores

Applicants are required to submit an approved English proficiency exam score that meets the minimum program requirements below unless they have earned a bachelor's degree or higher from a regionally accredited U.S. institution or the equivalent from a country on our exempt countries list (http://www.gradcollege.txstate.edu/international/language.html#waiver).

- official TOEFL iBT scores required with a 78 overall
- official PTE scores required with a 52
- official IELTS (academic) scores required with a 6.5 overall and minimum individual module scores of 6.0
- official Duolingo Scores required with a 110 overall
- official TOEFL Essentials scores required with an 8.5 overall

This program does **not** offer admission if the scores above are not met.

Degree Requirements

The Doctor of Philosophy (Ph.D.) degree with a major in Mathematics Education requires 78 semester credit hours for students admitted with a bachelor's degree. Students entering with a master's degree in mathematics can request up to 24 credit hours of transfer course work to be approved by the dean of The Graduate College upon recommendation from the Ph.D. program director. See the transfer credit section of this catalog for information about requesting transfer work.

Course Requirements

Students who do not have the appropriate background course work may be required to complete leveling courses.

Code	Title	Hours
Required Courses		
ED 7352	Beginning Qualitative Design and Analysis	3
or CI 7352	Beginning Qualitative Design and Analysis	
MATH 7302	History of Mathematics	3
MATH 7303	Analysis I	3
MATH 7306	Current Research in Math Education	3
MATH 7307	Algebra I	3
MATH 7324	Curriculum Design & Analysis	3
MATH 7325	Statistics 1	3
MATH 7328	Instructional Techniques & Assessments	3
MATH 7346	Quantitative Research Analysis in Mathematics Education	3
Choose 6 hours from the following:		6
MATH 7321	Graph Theory	
MATH 7331	Combinatorics	
MATH 7354	Advanced Qualitative Research	
MATH 7358	Advanced Quantitative Research in Mathematics Education	
Prescribed Electives		
Choose 24 hours from the following:		27
MATH 7188	Seminar in Mathematics Education	
MATH 7309	Topology I	
MATH 7313	Analysis II	
MATH 7317	Algebra II	
MATH 7319	Topology II: Algebraic Topology	
MATH 7321	Graph Theory	
MATH 7323	Theories of Knowing and Learning in Mathematics Education	
MATH 7331	Combinatorics	
MATH 7335	Statistics II: Linear Modeling	
MATH 7366B	Teaching K-12 Students (Elementary, Middle School, and High School)	
MATH 7366C	Teaching Teachers (In-Service; Pre-Service)	
MATH 7366D	Teaching Specialized Content	
MATH 7366E	Developmental Mathematics Curriculum	
MATH 7366F	Research in Undergraduate Mathematics Education I	
MATH 7366G	Research in Undergraduate Mathematics Education II	
MATH 7371A	Advanced Graph Theory	

MATH 7371B	Advanced Combinatorics	
MATH 7371C	Combinatorial Number Theory	
MATH 7371D	Discrete Optimization	
MATH 7371E	Algorithms and Complexity	
MATH 7371F	Probabilistic Methods in Discrete Mathematics	
MATH 7371G	Applied Discrete Mathematics	
MATH 7371H	Combinatorial Networks	
MATH 7378A	Problem Solving, Reasoning, and Proof	
MATH 7378B	Connecting and Communicating Math	
MATH 7378C	Students' Mathematical Ideas	
MATH 7378D	Math Technologies	
MATH 7378F	Research on Mathematical Problem Solving in Secondary Schools	
MATH 7378G	Discourse Processes, Traditions, and Analysis in Mathematics Education	
MATH 7378H	Equity in Mathematics Education	
MATH 7386	Independent Study in Mathematics Education	
MATH 7389	Internship	
MATH 7396	Mathematics Education Research Seminar	
May choose advisor-approved electives from outside the department		
Dissertation		
Choose a minimum of 18 hours from the following:		18
MATH 7199A	Dissertation in Mathematics Education	
MATH 7299A	Dissertation in Mathematics Education	
MATH 7399A	Dissertation	
MATH 7599A	Dissertation in Mathematics Education	
MATH 7699A	Dissertation in Mathematics Education	
MATH 7999A	Dissertation in Mathematics Education	
Total Hours		**78**

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.

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.

Comprehensive Examination Requirements

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 applied toward the degree. Students need to indicate their intent to advance to candidacy during the term they complete the 60 hours of required course work and other departmental requirements. The student will need to download the Advancement to Candidacy form from The Graduate College website. The student will need to complete the form and return it to the doctoral program director. The doctoral program director will then submit the completed form to the dean of The Graduate College for review.

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.

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.

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

Courses Offered

Education (ED)

ED 7199A. Dissertation.
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.
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

ED 7199B. Dissertation.
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.
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

ED 7299A. Dissertation.
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.
2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

ED 7299B. Dissertation.
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.
2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Graduate Assistantship|Exclude from Graduate GPA
Grade Mode: Leveling/Assistantships

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.
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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Multicultural Perspective|Multicultural Content
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.
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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7315. Models of Inquiry: Understanding Epistemologies.
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.
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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7317. Instructional Leadership for Organizational Change.
This course will introduce students to the major stream of research on instructional leadership and organizational change in education while analyzing models of leadership and change from critical, systemic, and cross-cultural context lenses. The relationship between instructional supervision, professional development, and curriculum development, with experiential applications will also be explored. Prerequisite: Instructor approval.
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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7319. Foundations of Educational and Community Leadership.
This course examines the philosophical, political, psychological, cultural, ethical, and technological foundations of educational and community leadership, with a focus on the purpose of education and history of educational and community leadership in American education and how leadership shapes teaching and learning. Some topics related to educational and community leadership to be explored include decision and policy making, school culture, schools as learning communities, the change process, action plans, and research-based school improvement models/networks.
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, all with a grade of "B" or better. Restriction: Doctoral standing.
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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7322. Human Resource and Professional Development.
Examines the methods, practices, and issues of facilitating learning related to occupational, professional, and volunteer roles. Prerequisites: Core courses or instructor's permission.
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 7325. Sociocultural Dynamics in Learning Communities.
This course draws on interdisciplinary literature to explore social, cultural, historical, and political dynamics and its implications on education for people, organizations, and communities. This will involve an exploration of the sociocultural dynamics in learning communities through a personal lived perspective and through the ecologies of knowing framework (Guajardo et al., 2013; Guajardo et al., 2016): self, organization, and community. Prerequisite: Instructor approval.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7326. Policy and Politics as 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 politics as practice in a democratic society. Prerequisite: Instructor approval.
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 with a grade of "C" or better.
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 and ED 7327 and ED 7351 and ED 7352, all with a grade of "C" or better.
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 with a grade of "C" or better.
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.
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. Prerequisites: Core courses or instructor's permission.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7334. Processes for Educational Evaluation and Analysis.
This course focuses on the development of the requisite knowledge and skills to facilitate the evaluation and analysis of educational programs and initiatives in complex community and school settings to inform pedagogy, leadership and community development. The course includes the assessment, evaluation, and analysis of student learning at the individual, classroom, school, and system level; teacher assessment; and program assessment. Prerequisite: Instructor approval.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7341. Dissertation Proposal Development.
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 and ED 7352, and ED 7353 or ED 7354, all with a grade of "B" or better. Departmental approval required.
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.
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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

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

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

ED 7353. Intermediate Quantitative Research 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 grade of "B" or better, or instructor's permission.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

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

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

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, all with a grade of "B" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

ED 7364. Personal, Team, and Professional Development in Education.
This course focuses on the interconnectivity and development of individuals and teams to acquire the knowledge, skills, and dispositions needed in professional education contexts 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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

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

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

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

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.
3 Credit Hours. 2 Lecture Contact Hours. 1 Lab Contact Hour.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

ED 7389C. Advanced Theory in Qualitative Research.
This 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.
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 purpose of this course is to explore the possibilities of narrative research. The course will provide an overview of narrative inquiry, look at various theories and corresponding examples of research, and explore, analyze, and interpret data using narrative methods. Prerequisites: Introduction to Qualitative Research and Intermediate Qualitative 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. (MULT).
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Multicultural Content|Topics
Grade Mode: Standard Letter

ED 7389H. Oracy and Language Expression for Educators.
This course focuses on the theory and practice of language expression. It emphasizes the relationship between audience analysis, speaker goals, organized outlines, delivery and development of personal style of presentation skills. The course offers direct experience writing, delivering, and constructively evaluating public speeches in a variety of educational contexts.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

ED 7389I. Comparative Studies in International Adult Education.
This course compares a model of adult learning, communities of practice (CoP) today with its practice in pre-historical times. It will involve international travel and working with scholars to contrast theory and practice in the United States with the new setting. Students from both contexts will be encouraged to present their work in a conference format.
3 Credit Hours. 2 Lecture Contact Hours. 1 Lab Contact Hour.
Course Attribute(s): Exclude from 3-peat Processing|Topics
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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter

ED 7389M. Shifting Demographics in Texas: Exploring Education, Democracy and Healthy Communities.
Students will explore the shifting population in Texas through multiple frames including historical, sociological, anthropological and political. Class will canvas the literature and emerging community conditions as a vehicle for imagining possible theoretical, policy and local responses to the conditions we see in schools and local communities.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

ED 7389O. Educational Privatization: Policies, Actors, and Effects.
This course interrogates the origins and outcomes of educational privatization. In this course, students will review the foundations of education as a public good, study frameworks and theories of privatization, trace public policies promoting privatization, delineate types of educational privatization over time, and examine the actors involved in educational privatization.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

ED 7389P. International Comparative Adult, Community, and Higher Education Research and Study: Italy.
This course develops theoretical knowledge, methodological skills, and scholarly capacity for educational research. It focuses on comparative adult, higher, and socio-cultural education within the complex educational environment of Italy, involving seminar components held at the university and research fieldwork and presentation in Italy. Prerequisite: Should the student not be able to participate in the international component of the course, a domestic alternative can be discussed prior to enrollment.
3 Credit Hours. 2 Lecture Contact Hours. 1 Lab Contact Hour.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

ED 7389Q. Schools, Communities and Race in a Democratic Society.
The class explores race through a personal lived perspective. This class will view race as a social construct. Students will interrogate the phenomena of race through multiple lens and frames, including but not limited to, an ontological perspective, its use in organizations, and its use in re-segregating society.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

ED 7389R. Understanding the Self: Anatomy of Engaged Scholarship.
Successful leadership in school settings requires an understanding of human behavior. This understanding begins with knowledge of self and leads to the understanding of others at the micro and macro levels. The focus of this course is on you, the learner, and your surroundings. The goal is to enhance the student's self-awareness of values, beliefs, attitudes and the ecological context informing and impacting their school leadership experience. This understanding will inform the past, but also begin to inform your future as you matriculate through your course work. We will employ interdisciplinary literature to inform this work.
3 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

ED 7389S. Feminist and Critical Thought in Education.
Feminist and Critical thought provides a means to examine and understand how issues of power shape and impact cultures, societies, and their associated policies and practices. In this seminar, students will engage with varying feminist and critical perspectives, frameworks, theories, epistemologies and methodologies to consider their application in examining their own educational journeys as well as current and systemic issues in education. Course readings and materials will primarily draw from the work of seminal and minoritized feminist and critical scholars, while providing students an opportunity to identify and explore course readings and materials of their choice as well.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

ED 7389T. LGBTQIA+ Issues in Educational Leadership.
This course examines the intersectionality of gender identity, sexual orientation, and other identities within the educational context, offering a nuanced exploration of the social, legal, and psychological aspects that influence LGBTQIA+ experiences in schools. Participants will engage in critical discussions on policy development, cultural competence, and leadership strategies that promote diversity, equity, and inclusion. The course is designed to address the unique challenges and opportunities facing educational leaders in fostering inclusive and affirming environments for LGBTQIA+ individuals.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

ED 7389U. The Critical Theory and Critical Pedagogy of Paulo Freire.
This course introduces the student to the basic theoretical contributions of critical theorist and pedagogue Paulo Freire, situating his work within the larger scope of critical theory. While Freire was an educator, this course is an appropriate elective not just for graduate students in education, but any graduate students across the social sciences interested in gaining a deeper understanding of critical theory.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

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.
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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dual Enrollment Permitted
Grade Mode: Credit/No Credit

ED 7599A. Dissertation.
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.
5 Credit Hours. 5 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

ED 7599B. Dissertation.
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.
5 Credit Hours. 5 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

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.
6 Credit Hours. 6 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

ED 7699B. Dissertation.
Students produce a dissertation under direct supervision of dissertation advisor. While conducting dissertation research and writing, students must be continuously enrolled. Prerequisites: Core, Concentration, and Methodology courses or instructor's permission.
6 Credit Hours. 6 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

ED 7999A. Dissertation.
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.
9 Credit Hours. 9 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

ED 7999B. Dissertation.
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.
9 Credit Hours. 9 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

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 earn graduate degree credit.
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Course Attribute(s): Graduate Assistantship|Exclude from Graduate GPA
Grade Mode: Leveling/Assistantships

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.
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Grade Mode: Standard Letter

MATH 7199A. Dissertation.
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.
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

MATH 7299A. Dissertation.
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.
2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

MATH 7301. Studies in Mathematics.
This course provides basic foundations in Mathematics for students
entering the doctoral program in Mathematics or Mathematics Education.
This course may be repeated. This course does not earn graduate degree
credit.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Exclude from
Graduate GPA|Leveling
Grade Mode: Leveling/Assistantships

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

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

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

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

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

MATH 7313. Analysis II.
This course covers the theory of integration with special emphasis
on Lebesgue integrals. Topics include: Lebesgue integral, Bounded
Convergence theorem, differentiation and integration, absolute continuity,
and Lp spaces. Prerequisite: Math 7303.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

MATH 7315. Calculus of Variations.
This course will involve the study of properties of functionals including
first and second variations, application to extremal problems, Euler-
Lagrange equations, and stability theory. Prerequisite: MATH 7303 with a
grade of "B" or higher.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

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

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

MATH 7321. Graph Theory.
Topics in this course include trees, connectivity of graphs, Eulerian graphs, Hamiltonian graphs, planar graphs, graph coloring, matchings, factorizations, digraphs, networks, and network flow problems. Prerequisite: MATH 3398.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

MATH 7323. Theories of Knowing and Learning in Mathematics Education.
This course surveys the major theories of knowing and learning that have influenced mathematics education. These theories include behaviorism, constructivism, sociocultural theories, situated cognition, and others.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

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

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 and Math 3305.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

MATH 7328. Instructional Techniques & Assessments.
This course examines, analyzes, and evaluates the various concepts, topics, methods, and techniques of instruction in Mathematics Education and the related assessment procedures for each for grade levels P-20.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

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

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

MATH 7337. Mathematical Statistics II.
This course covers foundations of classical and modern mathematical statistics. Topics include multivariate normal distributions, central limit theorem (including Lindeberg condition), data reduction principles, delta method, asymptotic theories for likelihood-based method, decision-theoretic formulation of estimation and testing of hypotheses, minimaxity, admissibility, and bootstrap.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

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

MATH 7354. Advanced Qualitative Research.
This course encompasses the techniques and tools needed for the development, investigation, and demonstration of competence in conducting qualitative research in mathematics education. Principles of qualitative data analysis are a significant focus of the course, with particular attention given to specific methods used to code and analyze data. Prerequisite: ED 7352 with a grade of "B" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter

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 or CI 7352.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

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

MATH 7358. Advanced Quantitative Research 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 the use of appropriate design methodologies to achieve the most substantial evidence to support or refute a knowledge claim. Prerequisite: MATH 7346 with a grade of "B" or better or permission of instructor.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

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

MATH 7363A. COMPLEX ANALYSIS.
This course is a brief introduction to the complex number system and basic point-set topology of the complex plane, followed by a proof-based and rigorous study of the principal results of the analysis of functions of a single complex variable. Prerequisite: MATH 4315 with a grade of "D" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

MATH 7363B. NUMERICAL ANALYSIS.
This course will involve the analysis of algorithms from science and mathematics, and the implementation of these algorithms using computer algebra systems. Symbolic, numerical, and graphical techniques will be studies. Applications will be drawn from the sciences, engineering, and mathematics. Prerequisite: MATH 3323 with a grade of "D" or better or instructor approval.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

MATH 7363C. FUNCTNL ANALYSIS.
This course presents the three basic fundamentals theorems of functional analysis: the Hanh-Banach theorem, the uniform boundedness theorem, and the open mapping theorem. Prerequisite: MATH 7303 with a "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

MATH 7363E. Numerical Analysis II.
This course will involve the analysis and numerical implementation of algorithms to solve partial differential equations. Applications will be drawn from science, engineering, and mathematics. Topics include the numerical solution of linear partial differential equations and the related linear systems of equations. Prerequisite: MATH 7363B with a letter grade of a "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

MATH 7363F. Functional Analysis II.
This course will involve the analysis of infinite dimensional vector spaces including spaces of functions, measures, and distributions. Topics include Fourier transforms, theory of Banach spaces, and operator theory. Prerequisite: MATH 7363C with a grade of "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

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

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

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

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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): 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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

MATH 7366F. Research in Undergraduate Mathematics Education I.
Students will develop the requisite knowledge to become a good consumer of Research in Undergraduate Mathematics Education (RUME) research. The course will cover the theoretical underpinnings of current and historic RUME research. Students will develop the knowledge to understand relevant theoretical stances and the role they play in research. Prerequisite: Math 7306 or permission from the instructor.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

MATH 7366G. Research in Undergraduate Mathematics Education II.
In this course, students will develop necessary knowledge to design/conduct RUME research via a topic-driven look at current RUME research. Core topics include proof, analysis/calculus, abstract algebra, linear algebra, and differential equations. Students will develop a depth of knowledge related to these topics and engage in research design and development. Prerequisite: MATH7306 and MATH7366F.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

MATH 7367B. ADV GROUP THEORY.
This course covers topics including properties of solvable, p-solvable and nilpotent groups, group actions, transfer theorems, simple groups and composition series, the generalized Fitting subgroup, automorphism groups, classical groups and linear representations of groups. Prerequisite: MATH 7307 with a grade of "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

MATH 7369C. Low-dimensional topology.
This course is an introduction to low-dimensional topology. Topics include surfaces, 3-manifolds, knots, and 4-manifolds. Prerequisite: MATH 7307 and MATH 7309 both with grades of "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

MATH 7369D. Characteristic Classes.
This course is an introduction to vector bundles and characteristic classes. Topics covered include Stiefel-Whitney classes, Chern classes, Euler class, Pontrjagin classes, and their computation. Additional topics may include manifold immersion problems. Prerequisite: MATH 7317 and MATH 7319 both with grades of a "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

MATH 7369E. Differential Geometry.
This course is an introduction to modern tools of differential geometry. Topics covered include manifolds, Riemannian metrics, connections, covariant derivatives, geodesics, curvatures, extrinsic and intrinsic computations. Other possible topics include hyperbolic geometry, Lie groups, Chern-Weil theory, surfaces of prescribed mean curvature, the Gauss-Bonnet theorem, and the Cartan-Hadamard theorem. Prerequisite: MATH 7307 and MATH 7309 both with grades of "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: 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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): 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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): 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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): 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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): 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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter

MATH 7371G. Applied Discrete Mathematics.
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, all with a grade of "C" or better, or with departmental approval.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): 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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter

MATH 7373B. Partial Differential Equations I.
This course covers the theory and application of partial deferential equations, typical equations of mathematical physics, Cauchy problem for equations of the first order, classification of second-order equations, Cauchy problem for second-order hyperbolic equations, Duhamel's principle, potential theory and elliptic equations, maximum principle, and parabolic equations. Prerequisite: MATH 3323, 3373 and 3380 with grades of "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

MATH 7373C. Partial Differential Equations II.
This course covers the existence and uniqueness theory for boundary value problems of partial differential equations (PDE) including the topics linear evolution equations, variational techniques, non-variational techniques, Hamilton-Jacobi equations, conservation laws. Prerequisite: MATH 7373B with a grade of "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

MATH 7373G. Spectral Methods.
This course covers the essentials of spectral collocation methods with an emphasis on numerically implementing algorithms. The problems studied will include ordinary and partial differential equations connected with fluid mechanics, quantum mechanics, waves, and other fields. The techniques used will include both Fourier and Chebychev methods. Prerequisite: MATH 7363E with a grade of "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|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

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

MATH 7375E. Computational Statistics.
This course focuses on commonly used sampling and optimization algorithms in statistics. Topics include accept-reject method, importance sampling, Markov Chain Monte Carlo algorithms, Fisher scoring algorithm, expectation-maximization algorithm, and minorization-maximization algorithm. Prerequisite: MATH 5305 or equivalent with a grade of "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

MATH 7375F. Multivariate Data Analysis.
This course focuses on statistical methodologies based on multivariate analysis. Topics include multivariate normal distribution, tests of hypothesis on means, multivariate analysis of variance, discriminant analysis, principal component analysis, factor analysis and canonical correlation analysis. Prerequisite: MATH 5305 and (MATH 3376 or MATH 3377) with a grade of "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

MATH 7375G. Bayesian Methods.
This course focuses on Bayesian statistical analysis and associated theories. Topics include one-parameter and multi-parameter Bayesian models, choices of priors, formulation of regression models in the Bayesian framework, and related data analysis. Prerequisite: MATH 5305 or equivalent with a grade of "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

MATH 7375I. Advanced Statistical Learning.
This course covers the theoretical foundations in statistical learning and deep learning. Topics include the framework of empirical risk minimization, metric entropy, Vapnik-Chervonenkis dimension, Rademacher and Gaussian complexity, symmetrization and chaining techniques, contraction principle, uniform law of large numbers, sample complexity, and neural networks. Prerequisite: MATH 7337 with a grade of "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

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

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

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

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

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 aslo be addressed.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter

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|Topics
Grade Mode: Standard Letter

MATH 7378G. Discourse Processes, Traditions, and Analysis in Mathematics Education.
Discourse and discourse analysis have been used to answer research questions across disciplines throughout the humanities and social sciences. This course will focus on theory and methods for the analysis of discourse in mathematical settings. We will learn how different approaches to discourse are used to understand mathematics learning. Prerequisite: MATH 7306.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

MATH 7378H. Equity in Mathematics Education.
Equity in Mathematics Education is a course examining research on equity issues in mathematics education. These equity issues will range from race, culture, class, and gender as they relate to the teaching, learning, and schooling of mathematics education. We will look at how equity is framed within the field of mathematics education, what has been addressed, and what has not been conceptualized. The course will help students understand the literature in the field, critique the extant research literature, design research, and consider important facets of teaching for various student groups. Prerequisite: MATH 7306 with a grade of "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

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.
Grade Mode: Standard Letter

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.
Grade Mode: Standard Letter

MATH 7387. Consulting.
This course focuses on developing skills in the collaborative practice of mathematics and statistics. This will be done through class discussion, readings, and different projects. Students will learn how to apply mathematics or statistics to solve real-world problems through case studies and collaborative projects. They will also learn how to apply ethical considerations to their professional practice. Taking this course will allow students to gain skills in problem solving and providing consulting services. Prerequisite: MATH 5305 or equivalent with a grade of a "C" or better.
3 Credit Hours. 2 Lecture Contact Hours. 3 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Credit/No Credit

MATH 7389. Internship.
In this course, students will work under the supervision of a faculty member to gain practical knowledge in their field. Student experience can come from industry, government agencies, or other sources but must directly apply to furthering knowledge of applications of mathematics or mathematics education.
3 Credit Hours. 0 Lecture Contact Hours. 10 Lab Contact Hours.
Grade Mode: Standard Letter

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, all with a grade of "B" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

MATH 7399A. Dissertation.
This course represents a Mathematics or 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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Credit/No Credit

MATH 7599A. Dissertation.
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.
5 Credit Hours. 5 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

MATH 7699A. Dissertation.
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.
6 Credit Hours. 6 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

MATH 7999A. Dissertation.
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.
9 Credit Hours. 9 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit