# Table of Contents

1. Introduction  
   A. Statement by the Department Chair  
   B. Purpose and Objectives of the Ph.D. Program  
   C. About Texas State  
      - Living in San Marcos  
   D. The Mathematics Department

2. Admission Policies

3. Financial Aid

4. Requirements for the Degree

5. Research Expectations

6. Residency Requirements

7. Doctoral Qualifying Examinations

8. Doctoral Comprehensive Examination

9. Research Advisor and Dissertation Committee Selection

10. Doctoral Dissertation  
    A. The Dissertation Proposal  
    B. Dissertation Submission Guidelines  
    D. Style and Organization of the Dissertation  
    E. The Dissertation Document  
    F. The Dissertation Defense  
    G. Time Limit for Completing the Dissertation

11. Appendices  
    - Program Audit Form  
    - Others
Introduction

We welcome you to the Ph.D. Program in Mathematics Education at Texas State University – San Marcos. The Department of Mathematics will provide an environment to help you become a highly qualified professional in Mathematics Education and someone who will contribute to making Texas a leader in mathematics, science and technology. The Ph.D. program offers rich experiences where you will learn to think critically, communicate mathematical concepts effectively, conduct research in mathematics education, and become lifetime learners.

You will be challenged to apply your mathematical knowledge in the context of research problems in mathematics education. All of these efforts will assist you in becoming a leader in teaching and research faculty roles.

We look forward to helping you achieve your professional goals.

Dr. Stanley Wayment, Chair
Mathematics Department


**Purposes and Objectives of the Program**

This program is designed for individuals 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 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.
About Texas State

Texas State's 28,132 students choose from 110 bachelor's, 88 master's and eight doctoral degree programs offered by the following colleges: Applied Arts, McCoy College of Business Administration, Education, Fine Arts and Communication, Health Professions, Liberal Arts, Science, University College and the Graduate College.

Texas State students come from around the globe, and our student body is diverse. Thirty percent of Texas State students are ethnic minorities. In fact, Texas State is ranked among the top 20 universities in the nation for the number of degrees we grant to Hispanic undergraduates. See the University Factbook for more information on our student body.

Location

Texas State's main campus is in San Marcos, a growing community of nearly 50,000 people about halfway between Austin and San Antonio. Located on the edge of the Texas Hill Country, where black land prairies roll into beautiful hills, Texas State enjoys a setting that is unique among Texas universities.

The beauty of the crystal-clear San Marcos River and the stately cypress and pecan trees on the campus adds to the charm of the university’s picturesque setting. Our location on the banks of the San Marcos River provides recreational activities for students throughout the year.

Since 2005, Texas State has also offered bachelor’s and graduate-level courses in Round Rock, Texas, at our Round Rock Higher Education Center (RRHEC) campus, located north of Austin. More than 1,500 students are enrolled at the RRHEC.

San Marcos Campus

As the university's student population has grown—from 303 in 1903 to 28,132 in 2007—our San Marcos campus, too, has expanded. Today it consists of a 471-acre main campus and 5,000 additional acres in recreational, instructional, farm and ranch land.

The Texas State campus is as diverse as the students who live and learn here. Our hilly campus is home to 225 buildings. Some, like Old Main, are as old as the university itself. Others, such as the brand-new McCoy Hall, with flat screen monitors rather than bulletin boards, and the Mitte Complex, which contains a high-tech clean room and microchip fabrication lab, are cutting-edge facilities.
At the Aquarena Center on the Texas State campus, you can see the second-largest springs in Texas through the floor of a glass-bottom boat. These springs feed the San Marcos River and are home to several endangered species, including the Texas Blind Salamander. In fact, as the site of the Aquarena Center, River Systems Institute and Edwards Aquifer Research and Data Center, our campus is one of the best places in the world to study aquatic ecosystems and species.

**History**

Authorized by the Texas Legislature in 1899, Southwest Texas State Normal School opened its doors in 1903. Over the years, the Legislature broadened the institution's scope and changed its name, in succession, to Normal College, Teachers College, College, University, and in 2003 to Texas State University-San Marcos. Each name reflects the university's growth from a small teacher preparation institution to a major, multipurpose university. Texas State's original mission was to prepare Texas public school teachers. It became renowned for carrying out this mission, but today it does far more.

**The Mathematics Department**

The Department of Mathematics provides an environment at the forefront of research that produces graduates highly qualified in Mathematics and Mathematics Education who will contribute to making Texas a leader in mathematics, science and technology. Offering a rich mathematical experience where students learn to think critically, communicate mathematical concepts effectively, and become lifetime learners, we maintain a nationally known community of faculty and students in the study of mathematics, mathematics education, discrete mathematics and related disciplines.


**Living in San Marcos**

For information concerning living accommodations in San Marcos please to [http://www.reslife.txstate.edu/housing-options-and-rates.html](http://www.reslife.txstate.edu/housing-options-and-rates.html)
Admission Policies

To be accepted into the Doctoral Program in Mathematics Education, you must have:

1. A Bachelor’s or Master’s degree in Mathematics, Mathematics Education, or a related field;

2. A 3.0 Grade Point Average (GPA) or better on a 4.0 scale on the highest degree earned, or a GRE Mathematics subject test score of 75th percentile or greater;

3. A preferred combined Verbal and Quantitative score on the Graduate Record Exam (GRE) of 1,100 or higher;

4. Demonstration of interest in a career as a mathematics educator.
   a. An essay of approximately 500 words in length describing the applicant's background and professional goals. This should include a rationale for pursuing a doctoral degree in Mathematics Education;
   b. An interview with program faculty;

5. Three letters of recommendation addressing the applicant's professional and academic background;

6. A preferred score of 600 on the paper-based TOEFL or on the internet-based TOEFL a minimum 78 total score with 4 minimum section scores, 19/Reading, 19/Listening, 19/Speaking, 18/Writing for international students.

Candidates who do not meet the above requirements may apply for conditional admittance. Provisions will be specified by the Doctoral Program Committee in cases where the appeal is granted.
# Financial Aid

<table>
<thead>
<tr>
<th>Type of Aid</th>
<th>Stipend</th>
<th>Brief Description</th>
<th>How to apply</th>
<th>Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional Assistants (IAs)/Teaching Assistants (TAs) (only for doctoral students)</td>
<td>IAs receive $26,780 on a nine month contract. (Fall and Spring semesters).</td>
<td>Normal duties of IAs include teaching two beginning mathematics classes each semester.</td>
<td>Send the following items to the Mathematics Dept.: Cover letter stating your intent, <a href="#">Employment application form</a>, and Current vita</td>
<td>Fall: March 1; Spring: Oct. 1</td>
</tr>
<tr>
<td>Research Assistants (RA)</td>
<td>RAs stipends depend on the types of research grants.</td>
<td>RAs work duties depend on the types of research grants.</td>
<td>Send the following items to the Mathematics Dept.: Cover letter stating your intent, <a href="#">Employment application form</a>, and Current vita</td>
<td>Fall: March 1</td>
</tr>
<tr>
<td>College Graduate Scholarships</td>
<td>Awards range from $1,000 to $2,500 per semester</td>
<td>To encourage students to complete a master’s or doctoral degree at Texas State University-San Marcos</td>
<td>For eligibility requirements and steps to apply <a href="#">click here</a></td>
<td>Fall: March 1</td>
</tr>
</tbody>
</table>

For other sources of financial aid go to the Financial Aid link on the Texas State Web site - [http://www.finaid.txstate.edu/](http://www.finaid.txstate.edu/)

**Note:** For detailed information concerning instructional/teaching assistantships please refer to the Mathematics Instructional Assistant/Teaching Assistant Policies and Procedures (Contact the mathematics office for a copy – [math@txstate.edu](mailto:math@txstate.edu))
Requirements for the Degree

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 doctoral 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.

<table>
<thead>
<tr>
<th>Course requirements*</th>
<th>Credit hours</th>
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<tbody>
<tr>
<td><strong>Type of Courses</strong></td>
<td><strong>Credit hours</strong></td>
</tr>
<tr>
<td>A Core Mathematics Education Courses</td>
<td>21</td>
</tr>
<tr>
<td>B Core Mathematics Courses</td>
<td>15</td>
</tr>
<tr>
<td>C Core Sequence Courses (choose 2 of 5)</td>
<td>6</td>
</tr>
<tr>
<td>D Prescribed Math Education Electives</td>
<td>12</td>
</tr>
<tr>
<td>E Prescribed Education Electives</td>
<td>3</td>
</tr>
<tr>
<td>F Free Electives</td>
<td>3</td>
</tr>
<tr>
<td>G Dissertation</td>
<td>18</td>
</tr>
<tr>
<td><strong>Total semester credit hours</strong></td>
<td><strong>78</strong></td>
</tr>
</tbody>
</table>

*Note: Your doctoral program of studies may be modified as a result of a change of your research goals or performance in the qualifying exams.

A. Core Mathematics Education Courses: This 21 hour requirement has two components. The first is a four course (12 hour) requirement consisting of the following Mathematics Education courses:
MATH 7306: Current Research in Mathematics Education
MATH 7302: History of Mathematics/Mathematics Education
MATH 7324: Curriculum Design and Analysis
MATH 7328: Instructional Techniques and Assessments
The second part of the Mathematics Education core requirement is a set of three courses (9 hours) to prepare students to be successful in conducting Mathematics Education research. Note that one of these courses is taught in the College of Education.
MATH 7346: Quantitative Research
ED 7352: Beginning Qualitative Design and Analysis
MATH 7356: Advanced Topics in Research (students must choose one of the topics courses that is offered under this heading)

B. Core Mathematics Courses: The following five Mathematics courses are required of all students in the program. This is a 15 hour requirement.
MATH 7303: Analysis I
MATH 7307: Algebra I
MATH 7309: Topology I
MATH 7325: Statistics I
Discrete Mathematics (choose one of the following)
MATH 7321: Graph Theory or MATH 7331: Combinatorics

C. Core Sequence Courses: Students will choose at least two of the following courses with the Mathematics Education Ph.D. Advisor's approval. This is a 6 hour requirement.
MATH 7313: Analysis II
MATH 7317: Algebra II
MATH 7319: Topology II: Algebraic Topology
MATH 7335: Statistics II: Linear Modeling
Discrete math not chosen above
or MATH 7321: Graph Theory or MATH 7331: Combinatorics

D. Prescribed Mathematics Education Electives: Each student in the Mathematics Education program will choose 12 hours of Mathematics Education electives. Notice that topics courses may be repeated if topics differ.
MATH 7111 Seminar in Teaching (up to 3)
MATH 7188 Seminar in Math Ed (up to 3)
MATH 7378: Topics in Standards
    MATH 7378A Problem Solving
    MATH 7378B Connecting/Communicating Math
    MATH 7378C Representing Math Ideas
    MATH 7378D Math Technologies
MATH 7366: Topics in Teaching
    MATH 7366A Teaching Post-secondary Students
    MATH 7366B Teaching K-12 Students
    MATH 7366C Teaching Teachers
    MATH 7366D Teaching Specialized Content
MATH 7386 Independent Study in Math Ed
MATH 7389 Internship
From Sam Houston State University:
STA 669 (SHSU) Research Consulting and Statistical Computing
Math 787 (SHSU) Foundations of Geometry with Applications
Math 784 (SHSU) Mathematics and Technology
Math 660 (SHSU) Special Topics: Research on Alternate Pathways for Mathematics Teachers
Math 660 (SHSU) Special Topics: Research Consulting and Statistical Computing

E. Prescribed Education Electives: Each student in the Mathematics Education program will choose 3 hours of Education electives from the College of Education. The selection of a course would require approval by the student's dissertation advisor in order to better complement and enhance the student's research interests. Normally, a student would take one of the courses
focusing on the theory of learning, although a student with a strong education background and dissertation advisor's approval could select any course in the College of Education. Allowing the students some flexibility to tailor the coursework to their own interests would enhance the experience and allow the student to obtain more in-depth information in one of his or her identified strands.

F. Free Electives: Three hours of coursework for the Mathematics Education program are elected from graduate programs at Texas State, but the selection requires approval from the student's dissertation advisor. Possible electives include additional coursework selected from Mathematics and Mathematics Education as well as coursework from the College of Education or from other graduate programs at Texas State. In Mathematics Education, up to 9 hours of Ph.D. level coursework from other departments at Texas State (for example, Education) may be used to meet elective requirements if approved by the Doctoral Program Committee and the dissertation advisor.

G. Dissertation: A student must register for a minimum of 18 hours of Dissertation coursework. MATH 7398: Dissertation

Residency Requirement: The student is required to take at least 18 hours within one academic year, or to be full-time for at least two consecutive semesters (fall/spring). We expect most students to be in residence for more than one year.

Teaching Experience: Each student in the Mathematics Education program is expected to have two years of teaching experience. A student who has taught for two or more years at full-time status in the public or private 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 semester 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.

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.

Transfer Credits: Normally, a student can request the transfer of up to 24 credit hours of equivalent graduate level coursework, upon recommendation from the student’s academic
program advisor. Additional transfer of credit may also be requested, but must be approved by the Doctoral Program Committee, the College Dean, and the Graduate Dean. Students who transfer course credit must still take the qualifying examination. No course in which the student earned a grade lower than a “B” will be considered for transfer credit. Students who enter either of the programs with a master’s degree in mathematics, mathematics education, or a related field can request that up to 24 credit hours of coursework be waived, upon recommendation from the student’s academic program advisor. Students who request such a waiver must still take the qualifying examination. [From the Mathematics Education Ph.D. program proposal.]

Research Expectations

The primary goal of the Mathematics Education Doctoral Program is to instill in each student an understanding of and capacity for scholarship, independent critical judgment, academic rigor, and intellectual honesty. Graduate students are expected to gain expertise in a particular area of study and seek to expand the knowledge of that disciplinary field by discovering and pursuing a unique topic of scholarly inquiry and research. As junior colleagues and professionals-in-training, graduate students should learn to impart disciplinary and interdisciplinary knowledge through appropriate forms of instruction and publication. They have academic freedom in addition to being respected as individuals and as junior colleagues.

More specifically, graduate students are encouraged to:

- Participate in a research practicum
- Present at conferences
- Assist in a research project
- Publish articles in refereed journals
- Conduct critical analyses of their teaching
- Implement and document innovative teaching practices
• Residency Requirements

The requirement for completing the standard residency for the Ph.D. program is enrollment in at least two consecutive semesters of full-time study. (Full-time equals a minimum of nine credits per fall & spring semesters). Summer sessions may not be counted toward the residency.

The goal of the minimum two-semester residency is to enrich the doctoral experience of students through:

• Scholarly activities beyond course work;
• Orientation to the profession;
• Intensive apprentice activities; and
• Opportunities for research.
Doctoral Qualifying Examinations

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. This exam will be over the Mathematics Education core.

The student is expected to consult with the Ph.D. Program advisor, or the chair of the Doctoral Program Committee regarding the selection of topics. The Doctoral Program Committee must approve the selection of topics for a student’s qualifying examinations. The exam will be given once in the Fall and once in the Spring over the course of a week, with no more than two topics being given in a single day. The schedule of exams will be announced in advance. No exam will be scheduled for which no students are enrolled. Students may take examinations over up to three of their selected topics during the week. Students may take individual qualifying examinations as soon as they are prepared in a particular topic. In the event of an unsatisfactory performance on an exam, the student will be required to meet with his/her advisor to discuss a remediation plan.

Most students are expected to pass their qualifying examinations by the end of their second year in the program. Students will be required to pass their three qualifying examinations by the end of their third year in the program.
Advancement to Candidacy

Doctoral students will need to be advanced to candidacy within four years of initiating Ph.D. course work. A student will need to indicate his/her intent to advance to candidacy during the semester the student will complete the 60 hours of the required course work.

No credit will be applied toward a student’s doctoral degree for course work completed more than five years before the date on which the student is to advance 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 student’s Ph.D. advisor, who in turn, submits a recommendation to the Dean of the Graduate College.

To be eligible for advancement to candidacy, the student must have a minimum GPA of 3.5. No grade earned below “B” on any graduate course work may apply toward a Ph.D. at Texas State.

Incomplete grades must be cleared through the Office of the Graduate College at least ten days before the approval for advancement to candidacy.

The student will need to pick up the Application for Advancement to Candidacy Form from the Graduate College (also available from the Graduate College Website). The student will need to complete the form and return it to his/her department, which will then submit it to the Office of the Graduate College.
Comprehensive Examination

Students will have an additional written comprehensive examination and an oral examination in Mathematics Education. These examinations will occur within two weeks of each other with the oral examination following the written examination. A student is expected to take these examinations after all other criteria for advancement to candidacy have been met.

Research Advisor and Dissertation Committee Selection

Ph. D. students must declare their research advisor by the time the qualifying examinations are successfully completed. In selecting such a person, the student needs to make sure that the faculty member meets the following requirements:

- Only Core Graduate faculty members who have been approved by the Doctoral Program Committee, the Chair, the College Dean, and the Graduate Dean are allowed to serve as a doctoral student’s dissertation advisor (p. 58/531 Program Proposal)
- Tenured or tenure-track status in the Department.
- Academic rank at the associate/full professor level.
- An appropriate track record of peer-reviewed research publications or other evidence of scholarly productivity appropriate to mathematics education, including research funds from external sources.
- Familiarity with mathematics education research and instructional issues.
- A record of successful participation in graduate education (such as teaching graduate courses, or serving in master’s thesis committees).
- Demonstrate a commitment to work with doctoral students.

If the faculty member agrees to serve as the research advisor, the student then obtains the Dissertation/Research Advisor Assignment Form from the Graduate College. This form must be signed by the student, the research advisor, the Chair of the Doctoral Committee, and the Department Chair and submitted to the Graduate College.

The selection and composition of the Dissertation Committee Members must follow these guidelines:
1. Student and doctoral dissertation chairperson jointly select the members of the dissertation committee. There should be a clear rationale for selection of members in terms of their contribution to the committee. In case there is a disagreement between the student and the chairperson with regard to committee membership, the chairperson has final veto power.

2. The Committee must have no less than four members including the chairperson. Three of the members must be from the Department of Mathematics and one from outside the department.

3. The Chair must be a member of the Core Doctoral Faculty and other Committee members, are required to be members of the Associate or Adjunct Doctoral Graduate Faculty.

4. The Committee shall have at least one member with expertise in quantitative or qualitative research.

5. The Committee members shall have expertise to contribute to the content of the dissertation.

**Changes in the Dissertation Committee**

There are times when a student may need to change research advisors. A change in the research advisor may be the result of one of the following circumstances:

- Death, retirement, incapacity, or resignation from the University of the research advisor;
- Loss of status as Ph.D. Core Faculty member on the part of the research advisor;
- A student’s decision that his or her academic and professional interests would be better served with a different research advisor.

If changes in the membership of the dissertation committee are necessary, the Ph.D. Dissertation Advisor/Committee Member Change Request form (see Appendix A) must be completed and signed by the student, new committee member, the Committee chair, the Ph.D. Program Director, and the Department Chair and then forwarded to the Dean of the Graduate College for approval and signature. Committee changes must be made at least sixty days prior to the dissertation defense. A committee member that retires or resigns from Texas State, but wishes to remain on a thesis or dissertation committee may do so with the approval of the student, Committee Chair, Ph.D. Program Director and the Department Chair. A written request accompanied by a written statement wherein the member states that he or she is willing to continue serving on the student's committee and that he or she understands that the university will not assume responsibility for expenses associated with committee service must be submitted to the Dean of the Graduate College for approval.

**Availability of Committee Members**

Keep in mind that while each committee member is committed to working on the thesis or dissertation, they also have various prior commitments. It is the student's responsibility to verify that the committee members will be available at required times.
Program Pathway [DRAFT]

The following flowchart illustrates the doctoral program processes.

Admission to the program

Course Advising

Take Courses

Research Experiences

Courses Completed? NO YES

Qualifying Exams

Meet with Advisor

Satisfactory Performance? NO YES

Select Dissertation Committee Advisor

Submit Dissertation Proposal to Diss. Comm. and (if approved) then to the Graduate College

Comprehensive Exam in Area of Research

Carry out dissertation

Final Dissertation Defense

Submit Dissertation

Exit Survey
The Dissertation Proposal

With the guidance of the student’s dissertation committee, the student will produce a proposal. This proposal states the problem the student intends to address and the means and resources with which the student intends to solve it. In preparing the proposal, the student should follow the latest edition of the American Psychological Association Publications Manual, using parenthetical citation and reference format, or conform to the specific guidelines in the student’s major department/graduate program.

It is the student’s responsibility to see that the proposed research procedures do not violate laws or university regulations. Any necessary permits and approvals must be secured prior to beginning the proposed research project. If a student’s research project involves human subjects, the student and research advisor must understand university regulations governed by the Texas State Institutional Review Board (IRB). An application or request for exemption must be submitted and be approved by the Texas State IRB before a research project involving the use of

1 The information contained in this section supplements, for the most part, the information given in GRADUATE COLLEGE GUIDE TO PREPARING AND SUBMITTING A THESIS OR DISSERTATION, http://www.gradcollege.txstate.edu/Thes-Diss_Info/T-D_Guide_Temp/contentParagraph/0/content_files/file/Thesis_Diss_Guide.pdf
human subjects can begin. Refer to the IRB website at http://www.txstate.edu/research/irb/ for additional information and to ascertain whether IRB approval is required for the proposed research project.

The Dissertation Proposal: Guidelines

1. Student meets with his/her chair of the dissertation committee to discuss the preparation of a formal dissertation proposal.

2. Student prepares the proposal for the dissertation study. This shall adhere to the guidelines for the dissertation that are set forth by the Graduate College. The proposal shall consist of the following components, though they might not occur in this order:
   a. Abstract
   b. Review of the literature
   c. Statement of the problem to be researched
   d. Research objectives or hypothesis(es)
   e. Methods section including the research sample, design, specific procedures and/or instruments to be used in the data collection, and proposed analysis strategy
   f. Discussion of potential limitations that may affect the way the study is conducted and its results
   g. Glossary of important terms
   h. References and appendices

3. Following the chair’s advice, student schedules a two-hour meeting with the dissertation committee to review the proposal. The student will follow a continuous review of the dissertation proposal prior to the proposal defense meeting. Committee members must receive a copy of the proposal at least two weeks prior to any meeting.

4. At the proposal meeting, the dissertation committee makes one of the following decisions: (1) approves the proposal as it is, with recommendations for changes that can be monitored by the chairperson, or (2) disapproves the proposal. The Chairperson summarizes agreed-upon changes at the proposal meeting. The student prepares a written memorandum of recommended changes and distributes it to all committee members.

5. If the proposal is approved, committee members sign a Defense of Dissertation Proposal Form (http://www.gradcollege.txstate.edu/Thes-Diss_Info/T-D_Forms). The student is required to submit this form, along with a copy of the approved proposal, including
revisions required by the committee, to The Graduate College. If the proposal is rejected, the student must follow the steps for submitting an initial proposal.

6. If revisions are required, the student must submit final revised copies of the proposal with a cover memo to all the members of the committee. The memo must specify what changes were made and where they are located in the revised proposal.

7. After the proposal has been approved, the student is required to contact the Institutional Review Board (IRB) to obtain specific requirements. See http://www.txstate.edu/research/irb/ for an explanation of the process of review and to obtain the necessary forms. This step must occur before the proposal is submitted to the Graduate College.

NO DATA CAN BE COLLECTED UNTIL WRITTEN APPROVAL FROM THE IRB IS RECEIVED.

8. Once the proposal has been finalized and approved, the student conducts the proposed research under the supervision of the chairperson (the Principal Investigator on the IRB protocol) and may also meet with committee members during the research process as necessary to report progress and to obtain advice. If a problem that necessitates any change in the originally approved research procedures arises during the conduct of the study, such problems must be reported to the chairperson and the dissertation committee. Any changes in research procedures must be approved by the student’s committee and by the IRB, by submitting an amendment to the original protocol. If the proposed change in procedure is approved, a revised copy the originally approved proposal with highlighted changes must be disseminated to all committee members and to the Graduate College.
Dissertation Proposal Submission Guidelines

One copy of the Ph.D. Dissertation Proposal form (see Appendix X) and proposal is submitted to the Graduate College. The proposal form must bear original signatures of the student, the student’s committee members, the Ph.D. Program Director and the Department Chair. The chair will forward the signed forms to the Dean of the Graduate College for review and signature. The Graduate College will return a copy of the approved dissertation proposal form to the committee chair. The Office of the Graduate College will retain the original approved proposal form and proposal.

Source: Graduate College Guide to Preparing and Submitting a Thesis or Dissertation. [Link]

For further details concerning topics related to doctoral dissertations, consult the Guide.

The Dissertation Document and Final Defense

1. The student’s dissertation should follow an appropriate style approved by the student’s committee and conform with the Graduate College guidelines.

2. The student submits carefully edited drafts of the various chapters of the dissertation (as per chairperson and/or committee request) to the dissertation committee and meets with the committee members to discuss the draft, as directed by the dissertation chair.

3. A draft of the dissertation should be provided to committee members at least two weeks prior to the final defense meeting. Additional committee meetings may be requested by either the student or committee chair/members.

4. The student makes changes required by the dissertation committee and prepares a final draft that will be used for the defense.

5. The student is required to prepare an abstract of the dissertation (350 word limit) according to the requirements of the Graduate School. The student must obtain approval of the
abstract from the dissertation chairperson and other committee members.

6. With the dissertation chairperson and his/her committee, the student schedules an oral defense of the dissertation. Oral defenses should be scheduled at a time when ALL Committee members are available. Dissertation abstracts and defense announcements will be distributed by the Dean of the College of Science.

7. The student is required to work with the chairperson of the committee to insure that all requirements have been met and that an examination room is reserved for a two-hour time block. It is the student’s responsibility to confirm that the examination room has been reserved for a two-hour block of time.

8. By the time the announcement of the defense has been distributed to the faculty, the student shall have distributed to the committee an edited draft of the dissertation that is ready for final typing and the defense. Members of the committee MUST HAVE AT LEAST TWO WEEKS to read the document and another week to give feedback to the chair. A defense should not be scheduled less than 3 weeks after the distribution of the final dissertation document. Students should be aware that the first date for a defense is tentative since the defense could be cancelled based on any committee member’s evaluation of the defensibility of the dissertation.

9. Any time prior to the defense, a member, who is unwilling or unable to work with the committee and/or the student, may be replaced at the discretion of the Dissertation Advisor and the Department Chair. The Dissertation Advisor/Committee Member Change Request Form should be completed with all required signatures and submitted to the Dean of the Graduate College.

The Dissertation Defense

The purpose of the doctoral defense is to provide an objective and scholarly forum in which the student is queried about the research methods, findings, and implications. Interested faculty and current students are encouraged to attend and follow the established guidelines.

1. It is the student’s responsibility to make available all necessary forms that require committee signatures.

2. The defense committee is the same as the dissertation committee. Any changes in the defense committee must be requested by the Committee Chair via the Department Chair to the Dean of the Graduate College for approval. The entire committee is required to attend the defense. In cases of emergency in which a member cannot attend the defense, the Chair
of the Department of Mathematics will appoint a substitute.

3. Committee members are expected to be at the defense a minimum of five minutes before the designated time. Questioning shall begin when all members of the committee are present.

4. If a quorum of the members of the Dissertation Committee is not present within fifteen (15) minutes after the scheduled starting time, the matter shall be immediately reported to the Associate Dean of the Graduate College or designee to determine the best course of action; e.g., delay, substitution, or postponement.

5. The chairperson of the committee shall determine the order in which members will question the candidate. Members may ask questions out of turn for points of clarification.

6. Prior to the questioning, the student will be requested to give: (a) a brief autobiographical sketch, and/or (b) a presentation regarding an overview of the study, including procedures and the findings of the dissertation. The candidate may bring resource materials and audiovisual aids to assist in answering questions or presenting the overview. Any committee member may request to review these materials.

7. During the defense, the student should be able to demonstrate that the objectives of the dissertation proposal have been met and done so in a scholarly fashion. The student should be able to demonstrate a working knowledge of the research methodology employed in the study and be able to integrate the research with knowledge of the discipline as well as to recognize any limitations or flaws in the design or conduct of the study and discuss how they may affect the conclusions.

8. Dissertation defenses are open to any interested member of the academic or professional community (other program or non-program faculty members, other program students or graduates, and so on). Only the presentation portion of the defense is open; individuals who are not members of the official committee will be excluded from other portions of the defense. Personal guests (adult friends or family members) may be allowed to attend the presentation, but this should be approved by the committee chair ahead of time. Personal guests who attend should realize they are attending a professional meeting as observers and do not ask questions.

9. At the completion of the questioning by Committee members, the candidate is excused from the room. Committee members then deliberate and evaluate the Candidate’s performance.

10. The defense is not a social event. Therefore, serving food is not appropriate.
Time Limit for Completing the Dissertation

In accordance with approved regulations, after advancement to candidacy, a student has five years in to complete the dissertation. Once the student goes beyond the required time limit, continuation in the program is subject to the approval of the Ph.D. Program Director, Department Chair, and Dean of the Graduate College. Requests for a time extension to complete degree program requirements must be justified in writing, approved by the Committee Chair, Ph.D. Program Director, Department Chair and submitted to the Dean of the Graduate College for approval.

If a student fails to complete the dissertation within the required time limit following advancement to candidacy, the student’s dissertation committee may require the student to take additional coursework and/or to repeat the comprehensive examination. This potential requirement is intended to ensure that the student’s research area knowledge base remains current.
Appendices
## Appendix A: Ph.D. in Mathematics Education Program Audit Form

Student Name: ___________________  ID: _______________________

### A. Core Mathematics Education Courses: (21 hour requirement)

<table>
<thead>
<tr>
<th>Math Ed Courses (12 hours)</th>
<th>Fulfilled</th>
<th>Date</th>
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<tbody>
<tr>
<td>MATH 7306 Current Research in Math Ed</td>
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<td>MATH 7302 History of Math</td>
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<td>MATH 7324 Curriculum Design and Analysis</td>
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<tr>
<td>MATH 7328 Instructional Techniques and Assessments</td>
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<tr>
<th>Research Courses (9 hours)</th>
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<tr>
<td>MATH 7346 Quantitative Research</td>
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<tr>
<td>ED 7352 Beginning Qualitative Design and Analysis</td>
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<tr>
<td>MATH 7356 Adv. Topics in Research. Choose 1 from:</td>
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<tr>
<td>MATH 7356A Advanced Quantitative Research</td>
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<tr>
<td>MATH 7356B Advanced Qualitative Research</td>
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### B. Core Mathematics Courses: (21 hour requirement)

<table>
<thead>
<tr>
<th>Core First Semester Courses (15 hours)</th>
<th>Fulfilled</th>
<th>Date</th>
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<tbody>
<tr>
<td>MATH 7303 Analysis I (w/ MATH 5373)</td>
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<td>MATH 7307 Algebra I (w/ MATH 5307)</td>
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<tr>
<td>MATH 7309 Topology I (w/ MATH 5329)</td>
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<tr>
<td>MATH 7325 Statistics I (w/ MATH 5390)</td>
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<tr>
<td>Discrete Math: Choose one of the following</td>
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<tr>
<td>MATH 7331 Combinatorics (w/ MATH 5350)</td>
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</table>
Core Sequence Courses (6 hours). Choose 2 from:

- MATH 7313 Analysis II
- MATH 7317 Algebra II
- MATH 7319 Topology II: Algebraic Topology
- MATH 7335 Statistics II: Linear Modeling

Discrete Math not chosen above:

- MATH 7331 Combinatorics (w/ MATH 5350)
- MATH 7321 Graph Theory (w/MATH 5355)

B. Mathematics Education Electives: (12 hour requirement)

Topics courses may be repeated if topics differ.

<table>
<thead>
<tr>
<th>Math Ed Electives (at least 12 hours)</th>
<th>Fulfilled</th>
<th>Date</th>
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</table>

- MATH 7366 Topics in Teaching
  - MATH 7366A Teaching Post-Secondary Student
  - MATH 7366B Teaching K-12 Students
  - MATH 7366C Teaching Teachers
  - MATH 7366D Teaching Specialized Content

- MATH 7378 Topics in Standards
  - MATH 7378A Problem Solving, ...
  - MATH 7378B Connecting/Communicating Math
  - MATH 7378C Representing Math Ideas
  - MATH 7378D Math Technologies

- MATH 7386 Independent Study in Math Ed
- MATH 7389 Internship
C. Other Electives (6 hour requirement):
   - 3 doctoral level hours from the College of Education approved by dissertation advisor, and
   - 3 other hours graduate credit approved by dissertation advisor.

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<thead>
<tr>
<th>Education Electives (3 hours)</th>
<th>Fulfilled</th>
<th>Date</th>
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<th>Other Electives (≥3 hours)</th>
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D. Dissertation Credits (18 hour requirement)
   - Need to have advanced to candidacy

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<tr>
<th>Dissertation (≥18 hours)</th>
<th>Fulfilled</th>
<th>Date</th>
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<tr>
<td>MATH 7399A Dissertation in Math Ed (repeated as needed)</td>
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E. Qualifying/Comprehensive Examinations
   - 2 Exams in Math & 1 in Math Ed over core courses. Need GPA ≥ 3.5 in courses for eligibility.
   - Written Comprehensive & Oral exam (including proposal defense). Need to have completed all other requirements but dissertation.

<table>
<thead>
<tr>
<th>Qualifying Exams in Mathematics (≥2)</th>
<th>Grade</th>
<th>Date</th>
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F. Other Requirements

- If TA: MATH 7188 Seminar in Math Ed (3 times)

- Residency: at least 18 hours within one academic year, or to be full-time for at least two consecutive semesters (fall/spring). Start: Finish:

- Teaching Experience: two year teaching experience requirement.

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<th>Teaching Position</th>
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Additional Comments and Waivers

1. Following courses were waived by Dr. White, because Mr./Ms. _________ took the corresponding Master’s level courses.
Appendix X: Forms

All the forms listed below can be obtained from the Graduate College Web site - http://www.gradcollege.txstate.edu/Thes-Diss_Info/T-D_Forms

- Application for Advancement to Candidacy
- Defense of Dissertation Proposal Form
- Dissertation Advisor/Committee Member Change Request Form
- Dissertation Committee Request Form
- Dissertation Research Advisor Assignment Form
- Ph.D. Dissertation Proposal Form
- Proposed Thesis Research Form
- The Graduate College Electronic Thesis & Dissertation (ETD) Deposit Agreement