Mathematics MA

Deliver A Curriculum With Appropriate Discipline Specific Knowledge Goal Description:

The MA program prepares students to teach undergraduate mathematics at the community college level, to teach dual credit or AP courses at the high school level, and/or to pursue further education at the doctoral level in mathematics education. The curriculum will address the discipline specific knowledge as dictated by professional societies (e.g., the American Mathematical Society (AMS), the Mathematical Association of America (MAA), the American Educational Research Association (AERA), the National Council of Teachers of Mathematics (NCTM), and the Association of Mathematics Teacher Educators (AMTE)) and/or professionals in the workforce (e.g., local community colleges (such as Lone Star and Blinn), Texas legislative mandates, and the Texas Education Agency (TEA)). Specifically, MA students will successfully complete:

- 4 core area courses (Algebra, Geometry, Analysis, and Probability/Statistics)
- an oral comprehensive exam covering the 4 core area courses
- an individualized mathematics education related capstone experience resulting in a specific completed product that could be used as part of an application to a doctoral program
- a minimum of 18 credits of pure MATH courses without any reference to "for teachers" in either the title or description of the course
- a pedagogical issues in undergraduate mathematics education course

Providing Department: Mathematics MA

Progress: Completed

RELATED ITEMS/ELEMENTS ------

RELATED ITEM LEVEL 1

Understanding Mathematical Structures

Learning Objective Description:

Students will prove theorems, solve problems and/or explain concepts in the following core areas

- abstract algebra structures such as groups, rings, fields, functions, homomorphisms, and isomorphisms.
- differential and integral calculus
- probability and statistics, particularly inferential statistics, and
- transformational geometry to include isometrics and non-isometric transformations such as circles of inversion.

Students will demonstrate their knowledge, skills, and abilities in these core areas by earned B's or higher in each course and passing a comprehensive oral examination.

Students will further complete a minimum of 18 credit hours of MATH coursework without "for teachers" in either the title or description of the course.

RELATED ITEM LEVEL 2

MA Comprehensive Oral Examination Indicator Description:

Students in the MA program will take an oral examination over the four areas covered in the objective. The oral examination will be scored by a committee of faculty using a rubric developed and approved by department faculty.

Criterion Description:

100% of the MA students will receive a grade of "Pass" or "High Pass" on each of the four areas according to the attached rubric.

Attached Files

Grading Scheme for MA Orals.pdf

Findings Description:

During the 2023-24 assessment cycle, 8 students attempted and passed their oral comprehensive exams as follows:

Algebra: Pass (1 with zero needing a retake); High Pass (7)

Geometry: Pass (2 with zero needing a retake); High Pass (6)

Analysis: Pass (4 with zero needing a retake); High Pass (4)

Probability and Statistics (3 with zero needing a retake); High Pass (5)

The data used from the previous year allowed us to improve the preparation we offered in the CORE classes so that no one needed to retake any portion of their exams (a first for the program since we began to keep track of the data) and there was an overall increase in High Pass rates from 21.9% in 2023 to 68.8% in 2024.

RELATED ITEM LEVEL 3

MA Comprehensive Oral Examination Action

Action Description:

During the 2024-25 cycle, data similar to that collected last year will be collected. This data will then be used to evaluate how to improve CORE courses replicate the improvement in retake rates and increase High Pass rates.

RELATED ITEM LEVEL 2

Successful completion of 4 core courses Indicator Description:

Students in the MA program will successfully complete MATH 5386 (Concepts in Modern Algebra), MATH 5387 (Concepts in Transformational Geometry), MATH 5388 (Concepts in Analysis), and MATH 5389 (Concepts in Probability and Statistics).

Criterion Description:

100% of the MA student will earn B's or higher in all four core courses.

Findings Description:

During the 2023-24 cycle, the following CORE courses were offered with the included results:

Summer 23: MATH 5388: Concepts in Analysis; Enrollment: 12

Grade of A (8)
Grade of B (3)
Grade of C (1)

Fall 23: MATH 5389 Concepts in Probability and Statistics; Enrollment: 13

Grade of A (12)
Grade of B (1)

RELATED ITEM LEVEL 3

Successful completion of 4 core courses Action Action Description: Based on Summer 23 results for MATH 5388, a schedule change was made so that MATH 5388 will only be offered in Fall or Spring semesters allow for better passing rates as a summer term proved to short for everyone to succeed.

During the 2024-25 cycle, data similar to that collected for MATH 5389 and MATH 5388 during the last year will be collected for MATH 5386, MATH 5387, and MATH 5388. Pass rate data will then be used to evaluate ways to improve CORE courses.

RELATED ITEM LEVEL 2

Successful completion of pure math and pedagogical issues coursework **Indicator Description:**

Students in the MA program will complete a minimum of 18 credit hours of MATH coursework without "for teachers" in the title or description and a pedagogical issues in undergraduate mathematics education course.

Criterion Description:

100% of the MA students will earn an overall GPA of 3.0 or higher in all their coursework.

Findings Description:

During the 2023-24 cycle MA students enrolled in the following courses:

Summer 2023:

- 1. MATH 6382 Pedagogical Issues in Undergraduate Mathematics Education (9)
- 2. MATH 5388 Concepts in Analysis (12)
- 3. CIED 5343 Philosophy of Education (1)

Fall 2023:

- 1. MATH 5389 Concepts in Probability and Statistics (12)
- 2. MATH 6361 Logic and Set Theory (5)
- 3. MATH 6060 Independent Study (1)
- 4. CIED 5382 Instructional Coaching (1)
- 5. CIED 5341 Comparative Education (1)
- 6. CIED 5333 Professional Educator's Role (1)
- 7. CIED 5360 Advanced Techniques & Methods of Instruction (1)

Spring 2024:

- 1. MATH 6387 Concepts in Linear Algebra (13)
- 2. MATH 6386 Number Theory (10)
- 3. CIED 5383 Integrating Current Technology in Teaching (4)
- 4. CIED 5340 Foundations of US Education Curriculum and Instruction (2)

5. CIED 5382 Instructional Coaching (1)

6. CIED 5384 Curricular Trends (1)

7. CIED 5397 Human Growth and Development Across the Lifespan (1) 8. CIED 5370 Research in Teaching (1)

Only one student did not earn a 3.0 in Summer 2023 and was placed on probation.

RELATED ITEM LEVEL 3

Successful completion of pure math and pedagogical issues coursework Action **Action Description:**

During the 2024-25 cycle similar data as 2023-24 will be collected on course enrollment of MA students to understand enrollment patterns and improve course offerings. It is apparent that some MATH electives are not as attractive as some CIED courses. During 2024-25, we will look at reasons why some MATH electives are not chosen as often as others by taking with students and understanding why they chose a CIED course over another MATH elective.

RELATED ITEM LEVEL 1

Develop 100% Online MA Program Performance Objective Description:

Students are required to have a minimum of 18 credit hours of MATH coursework without "for teachers" in the title or course description. As such, the program needs a variety of elective courses offered every semester. The program has yet to have full slate of permanent electives available to provide students the optimal opportunity to meet the learning objective for the program. As such, the MA advisor will work on transitioning Special Topics Courses to regularly offered elective courses that fit the criteria for the program.

RELATED ITEM LEVEL 2

Submit Form B's to turn special topics courses into permanent courses KPI Description:

In order to have enough elective MATH courses for students in the MA program to have the optimal opportunity to take a minimum of 18 MATH credit hours without "for teachers' in the title or course description, a Form B for Concepts in Quantitative Research Methods which was taught as a Special Topics course in Summer 2022 needs to be submitted through the proper channels to be approved.

Target Description:

By Summer 2023, the Form B for MATH 6385 will be submitted for the University Curriculum Committee's approval.

Results Description:

As of the date of this report, the Form B for MATH 6385 has not been submitted. It will be submitted over 2024-25.

RELATED ITEM LEVEL 3

Submit Form B for last Special Topics Course

Action Description:

The Form B to change the last special topics course (related to applied statistics--although the name is yet to be determined) will be submitted over 2024-25. It was taught during Summer 2024 as a Special topics course and it was thought best to wait until after that to submit the Form B.

RELATED ITEM LEVEL 1

Program Evaluation

Performance Objective Description:

In order to assess the effectiveness of the MA program learning goals with respect to student learning, faculty will work together to develop a plan to be able to evaluate the effectiveness of the assessment measures of the Mathematics MA program.

RELATED ITEM LEVEL 2

Alumni Formal Assessments of MA Program KPI Description:

In order to better evaluate the effectiveness of the MA program, it would be helpful to get regular feedback from alumni as to the impact of their participation in the MA program on their career goals. In order to facilitate this, the graduate advisor will create and update two SHSU MA Alumni email

lists. One will be of SHSU emails and one will be of personal emails collected as students graduate. Over time this should allow program administrators to effectively contact alumni for program evaluation purposes.

The MA graduate coordinator will continue to add to and manage the two email distribution lists during 2023-24.

Target Description:

The MA graduate coordinator will manage and update the two email distribution lists at the end of every semester/term in order to gradually collect current alumni contact information.

Results Description:

The two email distribution lists were managed and updated at the end of each semester/term. There are now 15 current email addresses for alumni graduating between Fall 21 and Spring 24. The current 25 students are also updated as of Summer 24.

RELATED ITEM LEVEL 3

Alumni Formal Assessments of MA Program Action

Action Description:

The MA graduate coordinator will add to and manage the alumni distribution lists with throughout 2023-24.

RELATED ITEM LEVEL 1

Refine and implement an effective marketing strategy to increase enrollment **Performance Objective Description:**

During the 2023-2024 academic year, we will continue to refine and implement the marketing plan developed during the 2022-23 academic year for the 100% online MA program in order to continue to increase enrollment to the desired amount of 30 students in any given semester.

RELATED ITEM LEVEL 2

Implement Marketing Plan KPI Description:

By the end of Spring 2023, we will have begun to implement the revised Math MA marketing plan.

We will specifically ensure the MA websites are prepared to optimize search engine's abilities to find us. We will continue to target potential students using a combination of 80% search engine optimization and 20% social media advertisement based on on our initial funding. Funding will be sought for two campaigns a year rather than one.

(in Fall 2023 we will evaluate the effectiveness of our plan by obtaining data on the number of positive search engine searches, the number of social media clicks, and the number of inquiries and applications for the Math MA program compared to Fall 2022.)

Target Description:

By December 2023, the marketing team will meet to assess the effectiveness of the optimization plans from the previous campaign. By January 2024, funding will be sought via the department, the graduate school, SHSU online, and the dean's office to fund two marketing campaigns a year, rather than just one.

Results Description:

The marketing plan was significantly delayed and did not start until June 1st due to changes in the university's approach to marketing. While \$5000 was procured from COSET and \$3000 from the department, this delay in marketing affected Summer 2023 enrollment.

Implement Marketing Plan Action Action Description:

By December of 2024, the graduate advisor for the MA program will meet with SHSU marketing to refine the marketing plan based on the 2023-24 results and meet with the chair of the math/stats department, the dean of COSET, and the dean of the Graduate School to solicit funding to support the refined marketing plan.

By January 2025 there will be:

- 1. a refined marketing plan for the MA program
- 2. at least 2 meetings with SHSU marketing
- 3. at least one meeting with the chair of the MATH/STAT department to solicit department funding
- 4. at least one meeting with the dean of the COSET to solicit college funding
- 5. at least one meeting with SHSU online to solicit additional funding
- 6. at least one meeting with the dean of the Graduate School to solicit additional funding

Develop Research Skills

Goal Description:

Students will develop research skills commensurate with graduate student status and that could be relevant to their future teaching careers.

Providing Department: Mathematics MA

Progress: Completed

RELATED ITEMS/ELEMENTS

RELATED ITEM LEVEL 1

Demonstrate Research Skills

Learning Objective Description:

Students completing the MA in Mathematics will demonstrate mathematics education research skills by successfully completing an individualized capstone project in Math 5380 with an advisor. They will demonstrate their acquired knowledge, skills, and abilities from throughout the program through at least two of the following:

- Earning a B or higher in the course.
- Submitting a conference proposal to present their project results.
- Submitting a paper on the results of their project for publication in either a practitioner or research focused journal geared towards graduate student research.
- Creating and utilizing curriculum materials (text, technological applications, and/or media) developed through their project.
- Reflecting in writing on the research process and its applicability to their future career goals.
- Using their capstone experience to help them apply for further education at the doctoral level.

RELATED ITEM LEVEL 2

Research Project Assessment

Indicator Description:

MA students complete an independent mathematics education research project. The student works with a supervising professor who oversees and evaluates the work required of the student. A grade is assigned based on the individual requirements set forth by the supervising professor. In addition al least one written product will result from the project.

Criterion Description:

Students will be rated at least 80% on the research project rubric. Each student will be evaluated on an individualized rubric by their supervising professor.

At least one of the following written products will result from the project:

- Submitting a conference proposal to present their project results.
- Submitting a paper on the results of their project for publication in either a practitioner or research-focused journal geared towards graduate student research.
- Creating and utilizing curriculum materials (text, technological applications, and/or media) developed through their project.
- Reflecting in writing on the research process and its applicability to their future career goals.
- Using their capstone experience to help them apply for further education at the doctoral level.

Findings Description:

During the Summer of 2023, 3 students completed an independent mathematics education research project. 2 created and utilized curriculum materials developed through their projects. 1 used their capstone experience to help them in their position as their school's assessment specialist. All passed MATH 5380 with A's.

During Fall 2023, 1 student completed an independent mathematics education research project which resulted in online presentation to other MA students and colleagues at her community college. She passed MATH 5380 with an A.

During Spring 2023, 3 students completed an independent mathematics education research project. 1 created and utilized curriculum materials developed through their projects. 2 used their capstone experience to help them in their position as analyzing their school mathematics data. All passed MATH 5380 with A's.

RELATED ITEM LEVEL 3

Research Project Assessment Action

Action Description:

During the 2024-25 cycle, data similar to that collected during 2023-24 will be collected on MATH 5380. This data will be used to evaluate the effectiveness of MATH 5380.

Update to Previous Cycle's Plan for Continuous Improvement Item

Previous Cycle's Plan For Continuous Improvement (Do Not Modify):

Closing Summary

Building on the 2022-23 cycle, we will make the following improvements during the 2023-24 cycle:

- 1. To move forward in our Alumni Formal Assessments of MA Program, the MA Graduate Coordinator will continue to collect personal email addresses of our graduates as part of a distribution list of MA
- Alumni in order to send out a survey to assess the effectiveness of the MA program at a future date.2. To further market the 100% online MA program, we will requested \$2000 from the department to fund a continued marketing campaign going into Fall 2023 and Spring 2024. We will tweak what we learned from the last marketing campaign. We will then request \$2000-\$3000 each from COSET and the School of Graduate Studies. The goal is to have an eventual enrollment of at least 30 students with a possibility of up to 45.
- During Summer 2023, we will have 3 students participate in their oral comprehensive exams. In Fall 23, we will have 3 and in Spring 24 we will have 6. We will continue to collect data on retakes, pass, and high pass designations to better improve our 4 course courses.
- 4. During 2023-2024 we anticipate 8 students completing research projects (3 in Summer 2023, 2 in Fall 2023, and 3 in Spring 24).

- 5. During the Summer 23 and then throughout the process in 23-24, we will submit a revised Form B for Special Topics Course (MATH 5360) Quantitative Research in Education (this title may be revised) as we continue to round out the elective courses for the 100% online MA program.
- 6. In the 2023-2024 academic year, we anticipate conducting 11 oral comprehensive exams. This is quite large and very demanding on faculty's time. We will utilized a rotating Zoom approach where up to 4 students can be assessed in the same 2 hour block.

Update of Progress to the Previous Cycle's PCI:

Here is the progress we made on our plan for continuous improvement:

- 1. To move forward in our Alumni Formal Assessments of MA Program, the MA Graduate Coordinator continued to collect personal email addresses of our graduates as part of a distribution list of MA Alumni in order to send out a survey to assess the effectiveness of the MA program at a future date.
- 2. To further market the 100% online MA program, we were given \$3000 from the department and \$5000 from COSET. We tweaked what we learned from the last marketing campaign. The goal is to have an eventual enrollment of at least 30 students with a possibility of up to 45. We currently have 24 students who will be enrolled for Fall 23. The Spring marketing campaign was delayed from March until June of 2024 so that has impacted enrollment.
- 3. During Summer 23, we will had 3 students participate in their oral comprehensive exams. During Fall 2023, we will had 1 students participate. During Spring 2024, we had 3 students participate. During Summer 2024, we will have 2 more students participate.
- 4. During 2024-2025 we anticipate 9 students completing research projects (2 in Summer 2024, 3 in Fall 2024, and 4 in Spring 25).
- 5. During the Summer 24 and then throughout the process in 24-25, we will submit a revised Form B for Special Topics Course (MATH 5360) Quantitative Research in Education (this title may be revised) as we continue to round out the elective courses for the 100% online MA program.
- 6. During the 2023-24 year we revisited our procedures for oral comprehensive exams which resulted in much better retake rate (0%) and much higher High Pass rates (67.8%). In the 2024-2025 academic year, we anticipate conducting 6 exams. We will continue to utilize a rotating Zoom approach where up to 4 students can be assessed in the same 2 hour block.

New Plan for Continuous Improvement Item

Closing Summary:

Building on the 2023-24 cycle, we will make the following improvements during the 2024-25 cycle:

- 1. To move forward in our Alumni Formal Assessments of MA Program, the MA Graduate Coordinator continued to collect personal email addresses of our graduates as part of a distribution list of MA Alumni in order to send out a survey to assess the effectiveness of the MA program at a future date.
- To further market the 100% online MA program, we were given \$3000 from the department and \$5000 from COSET. We tweaked what we learned from the last marketing campaign. The goal is to have an
 - eventual enrollment of at least 30 students with a possibility of up to 45. We currently have 24 students who will be enrolled for Fall 23. The Spring marketing campaign was delayed from March until June of 2024 so that has impacted enrollment.
- 3. During Summer 23, we will had 3 students participate in their oral comprehensive exams. During Fall 2023, we will had 1 students participate. During Spring 2024, we had 3 students participate. During Summer 2024, we will have 2 more students participate.
- 4. During 2024-2025 we anticipate 9 students completing research projects (2 in Summer 2024, 3 in Fall 2024, and 4 in Spring 25).
- 5. During the Summer 24 and then throughout the process in 24-25, we will submit a revised Form B for Special Topics Course (MATH 5360) Quantitative Research in Education (this title may be revised) as we continue to round out the elective courses for the 100% online MA program.

6. During the 2023-24 year we revisited our procedures for oral comprehensive exams which resulted in much better retake rate (0%) and much higher High Pass rates (67.8%). In the 2024-2025 academic year, we anticipate conducting 6 exams. We will continue to utilize a rotating Zoom approach where up to 4 students can be assessed in the same 2 hour block.