# **Mathematics MA**

# Deliver A Curriculum With Appropriate Discipline Specific Knowledge

# **Goal Description:**

The curriculum will address the discipline specific knowledge dictated by professional societies and/or professionals in the workforce.

# Providing Department: Mathematics MA

# **Progress:** Completed

**RELATED ITEMS/ELEMENTS ---**

#### **RELATED ITEM LEVEL 1**

#### **Understanding Mathematical Structures**

# Learning Objective Description:

Students will prove theorems or solve problems 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.

#### **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 Fall 2021 four students participated in their oral comprehensive exams. Of these four, three passed all four subjects on the first try. Of these three, Algebra had 3 passes, Geometry had two passes and one high pass, Analysis had three passes, and Prob/Stats had two passes and one high pass. The fourth student passed Analysis the first time but needed to retake Algebra and Geometry a second time before passing, and Prob/Stats a third time.

In Spring 2022, three students participated in their oral comprehensive exams. Of these three, two passed all four subjects on the first try. Of these two, Algebra had one pass and one high pass, Geometry had one pass and one high pass, Analysis had one pass and one high pass, and Prob/Stats had two passes. The third student passed Analysis and Prob/Stats the first time but needed to retake Geometry a second time before passing, and is scheduled to retake the Algebra portion Summer 2022.

In addition, the prob/stats professor suggested a new oral comprehensive rubric which she began piloting with students in Spring 2022. It is attached here for reference.

# Attached Files

#### Prob\_Stats Comp Rubric.pdf

**RELATED ITEM LEVEL 3** 

# MA Comprehensive Oral Examination Action

# **Action Description:**

During Fall 2022, we will have 1 students participate in their oral comprehensive exams. During Spring 2023, we will have 3 students participate. During Summer 2023, we will have 2 students participate. During the 2022-23 year we will revisit our procedures for oral comprehensive exams. In the 2023-2024 academic year, we anticipate conducting 10 exams (8 of these during Spring 2024). This is quite large and very demanding on faculty's time. We will discuss if we should move to a hybrid written/oral exam as the program grows. We will also revisit the rubric for the exam.

#### **RELATED ITEM LEVEL 1**

# Develop 100% Online MA Program Performance Objective Description:

Work on transitioning Special Topics Courses to regularly offered courses.

#### **RELATED ITEM LEVEL 2**

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

Form B for Concepts in Linear Algebra, Intro to Analytical Statistical Techniques for Educational Research, and Advanced Mathematical Problem Solving (Summer 2022).

Form B's will be submitted following this timeframe:

- Concepts in Linear Algebra (by the end of Spring 2022)
- Intro to Analytical Statistical Techniques for Educational Research (by the end of Summer 2022)
- Advanced Mathematical Problem Solving (by the end of Summer 2022)

#### **Results Description:**

Form B's for Concepts in Linear Algebra and Advanced Mathematical Problem Solving were both submitted and approved by the University Curriculum Committee (UCC) in Spring 2022. The new catalog number for Concepts in Linear Algebra is MATH 6387 and the new catalog number for Advanced Mathematical Problem Solving is MATH 6385. The Statistics course (the name is being revised) was submitted in Spring 2022 but the (UCC) needed more information so the Form B will be revised according to their comments and resubmitted by the end of the Summer 2022 which was the original plan anyway.

**RELATED ITEM LEVEL 3** 

#### Submit Form B's to turn special topics courses into permanent courses Action

#### **Action Description:**

During the 2022-23 year, 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.

#### **RELATED ITEM LEVEL 1**

#### **Program Evaluation**

#### **Performance Objective Description:**

Begin to develop a plan to be able to evaluate the effectiveness of the Mathematics MA program.

#### **RELATED ITEM LEVEL 2**

#### **Alumni Formal Assessments of MA Program**

#### **KPI Description:**

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 create and manage the two email distribution lists with initial creation and population of both lists by Spring 2022.

#### **Results Description:**

The MA graduate coordinator created and is currently managing the two email distribution lists as of Spring 2022. This effort will continue as the program grows.

#### **RELATED ITEM LEVEL 3**

#### Alumni Formal Assessments of MA Program Action

#### **Action Description:**

To move forward in our Alumni Formal Assessments of MA Program, the next step to be taken will be to 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.

#### **RELATED ITEM LEVEL 1**

#### Refine and implement an effective marketing strategy to increase enrollment

#### **Performance Objective Description:**

During the 2021-2022 academic year, we will continue to refine and implement the marketing plan developed during the 2020-21 academic year for the 100% online MA program.

#### **RELATED ITEM LEVEL 2**

Implement Marketing Plan KPI Description:

By the end of Spring 2022, 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 begin to target potential students using a combination of 80% search engine optimization and 20% social media advertisement based on on our initial funding.

(in Fall 2022 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 2021.)

#### **Results Description:**

The marketing plan was initiated in Spring 2022. It has resulted in four new students starting in Summer 2022 and three enrolled new students for Fall 2022 with an expected 4-6 more applications coming as of May 2022. In the Fall of 2022, we will do another analysis of the final data associated with this year's marketing plan to put together revisions for the next marketing plan.

#### **RELATED ITEM LEVEL 3**

#### **Implement Marketing Plan Action Action Description:**

To further market the 100% online MA program, we will request \$2000 from the department to fund a continued marketing campaign going into Fall 2022 and Spring 2023. We will tweak what we learned from the last marketing campaign. If the department would support this, we would 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.

#### **RELATED ITEM LEVEL 2**

# Refine marketing plan for the 100% online MA program KPI Description:

By January of 2022, the graduate advisor for the MA program will meet with SHSU marketing to refine the marketing plan based on the 2020-21 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 2022 there will be:

1. a refined marketing plan for the MA program

2. at least 1 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 the dean of the Graduate School to solicit additional funding

#### **Results Description:**

By January 2022, the MA program coordinator met all 5 actions to refine the MA marketing plan. the plan was then implemented in March of 2022. RELATED ITEM LEVEL 3

Refine marketing plan for the 100% online MA program Action

# Action Description:

We will tweak what we learned from the last marketing campaign. We will examine the click data provided from the SHSU marketing department to better understand how to target our marketing efforts more effectively and implement this revised strategy during our next marketing campaign, Spring 2023.

# **Develop Research Skills**

#### **Goal Description:**

Students will develop research skills commensurate with graduate student status.

#### 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 research skills by successfully completed Math 5380 with an advisor.

#### **RELATED ITEM LEVEL 2**

# **Research Project Assessment**

#### **Indicator Description:**

MA students complete an independent 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.

#### **Criterion Description:**

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

#### **Findings Description:**

During Fall 2021, one student completed their Capstone course successfully. During Summer 2022, one student completed their Capstone course successfully. During Summer 2022, there are four students working on their capstone projects (the most the program has ever had at one time!)

With the growth of the MA program, a better way of preparing students for the capstone project was developed as part of the MATH 6385 (Advanced Mathematical Problem Solving) course Form B process. The description of this course is as follows: Students study advanced mathematical problem-solving processes and strategies and practice their learning by solving real-world problems to prepare them for their individualized end-of-program capstone research projects. Students will explore how to design, conduct, carry out, and report on a problem-solving project in a selected content area. Topics may include advanced concepts in algebra, geometry, financial mathematics, and calculus, including functions, graphs, complex numbers, and number systems.

This course will be taught for the first time during Summer 2022 as a MATH 5360 Special Topics course. It is hoped this will be a step forward in increasing the rigor and usefulness of the project to the MA students.

#### **RELATED ITEM LEVEL 3**

#### **Research Project Assessment Action**

#### **Action Description:**

During 2022-2023 we anticipate 7 students completing research projects (1 in Fall 2022, 4 in Spring 2023 and 2 in Summer 2023). We will evaluate the effectiveness of MATH 6385 in better preparing students for 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 success of the 2020-21 year, we plan to work on improving during 2021-22 in the following ways:

- 1. To move forward in our Alumni Formal Assessments of MA Program, the next step to be taken will be to create a distribution list of MA Alumni in order to send out a survey to assess the effectiveness of the MA program.
- 2. To further market the 100% online MA program, we would like to request another \$2000 from the department to fund an even more robust marketing campaign going into Fall 2021 and Spring 2022. We will tweak what we learned from the last marketing campaign to funnel a higher proportion of the funds to the Google Ads since this gave us a bigger bang for our buck. If the department would support this, we would then request a matching \$2000 each from COSET and the School of Graduate Studies. There is no reason the MA program could not have 2-3 times the enrollment we currently have without an increase in faculty. All we need is better online advertising to make this happen.
- 3. During Fall 2021, we will have 5 students participate in their oral comprehensive exams. During Spring 2022, we will have 2 students participate. This is the largest number we've ever needed to facilitate in a single year.
- 4. During 2021-2022 we anticipate 7 students completing research projects (1 in Fall 2021, 1 in Spring 22 and 5 in Summer 2022). This is the most we've ever had before in a single year.
- 5. During the 2021-22 year, I will ask the Math/Stats department policy committee to continue work on a COSET aligned policy.
- 6. During the 2021-22 year, we will next submit Form B's for Special Topics Courses (MATH 5360) Concepts in Linear Algebra and Introduction to Analytical Statistical Techniques for Educational Research as we continue to round out the elective courses for the 100% online MA program.

#### Update of Progress to the Previous Cycle's PCI:

Summary of work done to improve during the 2021-2022 year:

- 1. To move forward in our Alumni Formal Assessments of MA Program, the next step to be taken will be to create a distribution list of MA Alumni in order to send out a survey to assess the effectiveness of the MA program.
  - This was completed as planned.
- 2. To further market the 100% online MA program, we would like to request another \$2000 from the department to fund an even more robust marketing campaign going into Fall 2021 and Spring 2022. We will tweak what we learned from the last marketing campaign to funnel a higher proportion of the funds to the Google Ads since this gave us a bigger bang for our buck. If the department would support this, we would then request a matching \$2000 each from COSET and the School of Graduate Studies. There is no reason the MA program could not have 2-3 times the enrollment we currently have without an increase in faculty. All we need is better online advertising to make this happen.
  - This was completed at planned with the exception that we received \$1000 from the department instead of \$2000. We have seen the program grow by 7 students (4 in Summer 2022 and 3 so far for Fall 2022) while only graduating 2 in Fall 2021 and Spring 2022. We expect even more enrollments by Fall 2022.
- 3. During Fall 2021, we will have 5 students participate in their oral comprehensive exams. During Spring 2022, we will have 2 students participate. This is the largest number we've ever needed to facilitate in a single year.
  - We had 4 students participate and pass their oral comprehensive exams in Fall 2021 and two in Spring 2022. One also passed 3/4 subjects in Spring 2022 and will retest in Summer 2022.
- 4. During 2021-2022 we anticipate 7 students completing research projects (1 in Fall 2021, 1 in Spring 22 and 5 in Summer 2022). This is the most we've ever had before in a single year.
  - We had 1 student in Fall 2021, 1 student in Spring 2022 and we will have 4 students in Summer 2022 complete their capstone research projects this year. One student decided to go a little slower than planned and will complete their project this next year.
- 5. During the 2021-22 year, I will ask the Math/Stats department policy committee to continue work on a COSET aligned policy.
  - This did not happen this last year due to a very busy hiring season. However, in conjunction with the other grad advisors in the math and stats department, we will have a graduate handbook with policies on admission, graduate assistantships, comprehensive exams, and probation/expulsion by Summer 2022.
- 6. During the 2021-22 year, we will next submit Form B's for Special Topics Courses (MATH 5360) Concepts in Linear Algebra and Introduction to Analytical Statistical Techniques for Educational Research as we continue to round out the elective courses for the 100% online MA program.
  - We submitted Form B's for all three courses (a little ahead of schedule). Two courses were approved in this cycle and one will need a few more revisions but will be resubmitted by the original goal of the end of Summer 2022.

# New Plan for Continuous Improvement Item

# **Closing Summary:**

Building on the success of the 2021-22 year, we plan to work on improving during 2022-23 in the following ways:

- 1. To move forward in our Alumni Formal Assessments of MA Program, the next step to be taken will be to 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 request \$2000 from the department to fund a continued marketing campaign going into Fall 2022 and Spring 2023. We will tweak what we learned from the last marketing campaign. If the department would support this, we would 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.
- 3. During Fall 2022, we will have 1 students participate in their oral comprehensive exams. During Spring 2023, we will have 3 students participate. During Summer 2023, we will have 2 students participate.
- 4. During 2022-2023 we anticipate 7 students completing research projects (1 in Fall 2022, 4 in Spring 2023 and 2 in Summer 2023).
- 5. During the 2022-23 year, I will ask the Math/Stats department policy committee to continue work on a COSET aligned policy for grad coordinator evaluation.
- 6. During the 2022-23 year, 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.
- 7. During the 2022-23 year we will revisit our procedures for oral comprehensive exams. In the 2023-2024 academic year, we anticipate conducting 10 exams (8 of these during Spring 2024). This is quite large and very demanding on faculty's time. We will discuss if we should move to a hybrid written/oral exam as the program grows. We will also revisit the rubric for the exam.