

**Texas A&M International University
Annual Institutional Effectiveness Review (AIER)
for Academic Programs**

Program: Bachelor of Arts with a Major in Mathematics

Assessment Period Covered: January 1, 2009 to January 31, 2010

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Reviewed by Chair: Name _____ Date _____

Reviewed by Dean: Name _____ Date _____

The Annual Institutional Effectiveness Review for Academic Programs is directed at Goal 1: Academics of the Texas A&M International University 2006-2010 Strategic Plan:

Develop, maintain, assess, and improve academic programs, administrative/educational support services and student services, to admit, retain, and graduate students who achieve established learning outcomes designed to prepare them for success in their chosen careers.

Institutional Mission

Texas A&M International University, a Member of The Texas A&M University System, prepares students for leadership roles in their chosen profession in an increasingly complex, culturally diverse state, national, and global society ... Through instruction, faculty and student research, and public service, Texas A&M International University embodies a strategic point of delivery for well-defined programs and services that improve the quality of life for citizens of the border region, the State of Texas, and national and international communities.

Academic Program Mission

The faculty and staff of the Department of Mathematical and Physical Sciences are committed to excellence in teaching, research, service, and outreach. The programs within the Department lead to discovery, analysis, and dissemination of the knowledge of astronomy, computer science, engineering, mathematics, physics, and statistics. The Department provides a foundation in its disciplines for all graduate and undergraduate students as well as for teacher certification programs for mathematics and physical sciences majors. Our goals are to equip the graduates

with the tools necessary to fully participate in a technological society and competitive global environment. The Department is committed to:

- Transmit ideas and knowledge pertaining to disciplines within the Department through teaching, including active learning, and related activities.
- Contribute to the advancement of the disciplines within the Department through quality research and sponsored projects.
- Utilize the Department's resources to serve the University and community.
- Serve as a resource of knowledge and pedagogy of the disciplines within the Department for the benefit of the University and community through outreach activities.

Provide summary of the last cycle's use of results and changes implemented

Program faculty should evaluate the former cycle. This statement should specify if the outcomes addressed were a continuation of previous ones, new outcomes, or modified versions of previous outcomes. In addition, the statement should include a concise analysis of the assessment data collected during the previous year, a brief explanation of actions taken to address specific outcomes, an evaluation of how these actions contributed to the improvement of the program, and any recommendations formulated. Assessment data—including actual samples of student work—must be viewed and discussed by program faculty during this process.

The Department of Engineering, Mathematics, and Physics decided to assess two outcomes for this program during the 2008-2009 cycle. These were related to communication and student success in their chosen careers.

In the communication outcome we learned that some of our efforts to improve communication we had to do a few intentional efforts, such as,

- Give students the opportunity to have submitted papers reviewed before a final grade was assigned to it; this would give students an opportunity to think and improve their writing;
- Give students the opportunity to practice an oral presentation in front of their peers;
- Provide a clear example of a paper that students need to read before they write about ethics in Mathematics careers.

Changes that address all of the issues identified during the last cycle are being implemented as a result in the Fall 2009 semester.

In regards to the outcome about student success in their chosen career we realized that there is a lack of understanding of the relationship between the contents of the corresponding major field test and the contents of required courses for this program. As a result a study will be carried out during Fall 2009 by program faculty to understand this relationship and understand if there is any need to modify current courses in the program.

Selected list of program-level intended student learning outcomes *(It is recommended that programs rotate through their entire set of outcomes over a multi-year period. Programs may focus on one or two outcomes each year, as deemed appropriate).*

1. Students will be able to communicate effectively in written and oral forms, work successfully in teams, and understand ethical responsibilities.
2. Students will be able to think critically and be prepared for life-long learning.

3. Students will be able to continue graduate studies in Mathematics Education or related field.
4. Students will have a working understanding of the major disciplines in Mathematics, including Algebra, Analysis, Geometry/Topology, and Probability/Statistics. Students will also have the ability to read and write proofs and a working knowledge of mathematics software tools.
5. Students will be able to apply quantitative reasoning to solve problems in a discipline other than Mathematics. With this knowledge students are enabled to enter the workforce in areas such as business, finance, engineering, computer science, actuarial science, government, statistics, or secondary education.

Section I: Planning and Implementation

Outcome(s)

Identify the outcome(s) that will be focused upon this year.

1. Students will be able to communicate effectively in written and oral forms, work successfully in teams, and understand ethical responsibilities.

Please indicate if the outcome(s) is (are) related to writing (QEP).

Methods of assessment to be used: *The explanation should identify and describe the type of assessment(s) that will be used (e.g., survey, questionnaire, observation instrument, test, rubric to evaluate performance, standardized examination, action research, interviews, etc.), who will provide the information, and how the data will be obtained.*

The course MATH 2371, Communication in Mathematics, will be used to compile data. Papers from the students will be collected and graded using the rubric attached to this document. Students will also write an essay about ethics, and give at least one oral presentation in the course. A rubric to evaluate oral presentations has been developed, and is submitted together with this report.

Indicate when assessment(s) will take place

Data will be collected through Fall 2009

Criteria/Benchmark(s): *[Specify, if deemed appropriate to assess outcome(s). Criteria/ benchmark(s) may be optional, especially if qualitative measures are used for data collection.]*

100% of the students in this degree program will receive at least a grade of 3 in their paper using the rubric attached to this document. 100% of the students will receive a “B” in their paper about ethics, and 100% will obtain at least a grade 3 in the rubric for oral presentations.

Outcome(s)

Identify the outcome(s) that will be focused upon this year.

2. Students will be able to think critically and be prepared for life-long learning.

Please indicate if the outcome(s) is (are) related to writing (QEP).

Methods of assessment to be used: *The explanation should identify and describe the type of assessment(s) that will be used (e.g., survey, questionnaire, observation instrument, test, rubric to evaluate performance, standardized examination, action research, interviews, etc.), who will provide the information, and how the data will be obtained.*

Graduating seniors will be asked to take part in pilot program to take the Major Field Test in Mathematics by ETS at the end of their last semester.

Indicate when assessment(s) will take place

Annual

Criteria/Benchmark(s): *[Specify, if deemed appropriate to assess outcome(s). Criteria/ benchmark(s) may be optional, especially if qualitative measures are used for data collection.]*

66% of the students taking the standardized test will score at or above the national 50th percentile.

Section II: Analysis of Results

What were the results attained?

Describe the primary results or findings from your analysis of the information collected. This section should include an explanation of any strength(s) or weakness(es) of the program suggested by the results.

This year the Assessment Committee decided to assess two outcomes related to this degree. The following tables show the results relevant to each assessed item. The report includes all data collected, hence some differences may be found on the amount of available data for each table. In cases where a numerical score was used in this report, the following translation was used: A = 4.0, B = 3.0, C = 2.0 and F = 0. Each entry in the table shows the average of the Assessment Committee members in each category using this scale.

Outcome 1

Written Paper Report					
Student	Explanation of Mathematical Concepts	Understanding of Mathematical Concepts	Proof Writing	Grammar	Average
1	2	3	3	1	2.3
2	3	4	3	3	3.3
3	2	3	3	2	2.5
4	4	4	3	4	3.8
Average	2.7	3.5	3	2.5	2.9

Writing on Ethics	
Student	Grade
1	B
2	B
3	A
4	B
Average	B

Oral Presentation Assessment Results								
Student	Organization	Conveyed Point	Content Knowledge	Visuals	Mechanics	Delivery	Use of Notes	Average
1	3.3	3.3	4	3.7	3.7	4	3	3.6
2	3.5	4	4	3.5	4	3.5	3.5	3.7
3	4	4	4	4	4	4	3.5	3.9
4	3	3.3	3.3	4	2.7	3.3	2.7	3.2
Average	3.5	3.7	3.8	3.8	3.6	3.7	3.2	3.6

The table entitled “Written Paper Report” shows the results of the assessment for all students in this degree. In order to assess this outcome, we use the rightmost column in this table, that is, the average of each student in all of these categories. From the table one can see that 2 out of 4 students (50%) reached the benchmark. The data above shows that students do understand the mathematical concepts that they write about, as well as are capable of writing proofs. Students still need to improve on their expository skills, namely, grammar and explaining concepts.

The table entitled “Writing on Ethics” shows the results of the assessment for all students in this degree. From the table one can see that 4 out of 4 students (100%) reached the benchmark.

The table entitled “Oral Presentation Assessment Results” shows the average of the results obtained by each student in each area. In order to assess this outcome, we use the rightmost column in this table, that is, the average of each student in all of these categories. From the table one can see that 4 out of 4 students (100%) reached the benchmark. Assessment was conducted during the first week of December in 2009. The topic of the presentation was the content of their paper. Students show that they have mastered the content knowledge of their paper, as well as the mechanics, delivery and other points of their presentation. Their weakest area was the use of notes, probably due to nervousness.

Outcome 2

We are still making every effort to contact students to have them take the Major Field Test, but no student has agreed yet. If there are any changes, we will update this report accordingly.

What were the conclusions reached?

Should include a brief description of the procedure used for reaching the conclusion(s) based on the evidence collected and describe the process used to disseminate the information to other individuals. For example, if the discussion took place during the annual spring retreat, include a summary from those deliberations using the Meeting Minutes template found on the Project Integrate web page at <http://www.tamtu.edu/integrate/docs/Minutes-Template.doc>. Once completed, submit the minutes to assessment@tamtu.edu.

The results of the assessment show that students made progress in their goal to communicate Mathematics, and in the mean time they understood ethics in Mathematics. The plan to address writing must be improved to account for the area of Grammar, which was the weakest of all. The results of the oral presentation are encouraging.

In regards to the Major Field Test, we are not able to draw conclusions from the data for this year, however, the department conducted a study of the appropriateness of this exam to evaluate this program. Faculty received a copy of the topics covered in the test, and matched the topic to the course they teach where they cover such topic. As a result, the following areas have been identified as part of the test that are not part of the curriculum of the required courses for this program: Geometry (Euclidean, non-Euclidean, and differential geometry), Dynamical Systems, Point-set topology, Discrete Mathematics (Graph theory and Combinatorics), and Numerical Analysis. We are forwarding this information to the Department Curriculum Committee, who will determine if we should make changes on our programs, or if we should use a different means of assessment, or use sub-scores of this test as means of assessment.

Describe the action plan formulated. (The plan may be multi-year in nature.)

Based on the conclusion(s), describe the action plan to be implemented to improve or maintain student learning, including a timeline for implementation.

More emphasis will be given to grammar aspects of English in the written paper in the future. This may be accomplished by supplementing lectures with handouts, exercises, or add a reference book to this course.

Section III: Resources

Resource(s) to implement action plan:

Describe the resources that will be needed to implement the action plan. Also indicate if the resources are currently available, or if additional funds will be needed to obtain these resources.

Funding

- New Resources Required
- Reallocation of current funds

Physical

- New or reallocated space

Other

- Primarily faculty/staff time

- University/rule procedure change only

Provide a narrative description and justification for requested resources (include linkage to Strategic Plan)

Enter text here

Identify proposed outcomes for the next assessment cycle:

Continuation of present outcome(s) – (Indicate reason for continuation):

We will continue to attempt to assess the same outcomes, since these are one of the most important steps that a student must go through in this program.

New Outcome(s) – (List outcomes below):

Enter text here

Modification of present outcome(s) – (Indicate reason for modification):

Enter text here

Date Completed: March 1, 2010

Submit completed form to integrate@tamiu.edu.

Updated 09/03/2009