ASSESSMENT REPORT
FOR

<u>Bachelor of Science with a major in Mathematics (BS)</u>
Instructional Degree Program

<u>Spring 2004</u>
 Assessment Period Covered

<u>June 17, 2004</u>
Date Submitted

Expanded Statement of Institutional Purpose Linkage:

Institutional Mission Reference:
Texas A&M International University, a Member of The Texas A&M University System, is committed to the preparation of students for leadership roles in their chosen profession and in increasingly complex, culturally diverse state, national, and global society … Through instruction, faculty and student research, and public service, Texas A&M International University is 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.

College/University Goal(s) Supported:
The faculty and administrators of the College of Arts and Sciences and the Department of Mathematical and Physical Sciences are committed to providing a scholarly environment in which students prepare for productive lives in a dynamic world and in a changing global and technologically advancing environment.

Intended Educational (Student) Outcomes:
1. Students will demonstrate their mastery of formulating and solving problems in various areas of mathematics.

2. Students will be able to communicate mathematics in well-structured sentences.

3. Students will be able to undertake independent work, explore ideas, discover mathematics and develop correct mathematical arguments and proofs of their discoveries.

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Intended Educational (Student) Outcome:
NOTE: There should be one form for each intended outcome listed. The intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

    1   Students will demonstrate their mastery of formulating and solving problems in various areas of mathematics.

First Means of Assessment for Outcome Identified Above:
  1a.   Means of Program Assessment & Criteria for Success: Graduating students will be required to take part in a pilot study program towards the end of their final semester of studies by taking the Major Fields Test in mathematics by ETS; 50% of the students taking the standardized examination will score at or above the National 50th percentile.

  1a.   Summary of Assessment Data Collected: One student graduated, and took the Major Field Test with score 162.

  1a.   Use of Results to Improve Instructional Program: The current national distribution data has not been released. According to the past practice, this is below the national 50th percentile. To improve the result, we will offer a one-credit review section for graduating students.

Second Means of Assessment for Outcome Identified Above:
 1b.   **Means of Program Assessment & Criteria for Success:** Exit survey will be conducted with graduating seniors. The survey will include questions asking the students' perception of their own achievement pertaining to the intended outcomes; each response will be in a scale of 0 to 4, and average of 3.0 points or better for the responses to the relevant questions will be considered satisfactory.

 1b.   **Summary of Assessment Data Collected:** Students are not quite comfortable solving problems unfamiliar to them. They also responded that they are not comfortable using mathematical software such as Mathematica and Geometer's Sketch pad, which are powerful problem solving tools.

 1b.   **Use of Results to Improve Instructional Program:** To develop students' problem solving ability, we recommend that each mathematics instructor incorporates some problem solving projects in the courses. We will create a database for such projects to facilitate exchange of ideas and information between instructors. We also recommend that some of the projects have an element of experiment and/or exploration. As for computing, we would like to have a computer laboratory housed within the department with a lab monitor/technician so that students and faculty can easily access to computing facility at any time.

Third Means of Assessment for Outcome Identified Above:
 1c.   **Means of Program Assessment & Criteria for Success:** Final exams of each of the 3000-4000 level courses will be reviewed by the instructor with respect to the students' problem solving skill, and each exam paper will be given a point in a scale of 0 to 4. The class average of 2.5 point is considered satisfactory. Instructor will look at students' ability (1) to find a correct strategy to solve the problem, and (2) to carry out the strategy and solve the problem correctly.

 1c.   **Summary of Assessment Data Collected:** Average point was 2.3 in 4-point scale.

 1c.   **Use of Results to Improve Instructional Program:** To develop students' problem solving ability, we recommend that each mathematics instructor incorporates some problem solving projects in the courses. We will create a database for such projects to facilitate exchange of ideas and information among instructors. We also recommend that some of the projects have an element of experiment and/or exploration.

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   2   Students will be able to communicate mathematics in well-structured sentences.

First Means of Assessment for Outcome Identified Above:
  2a.   **Means of Program Assessment & Criteria for Success:** Graduating students will be required to take part in a pilot study program towards the end of their final semester of studies by taking the Major Fields Test in mathematics by ETS; 50% of the students taking the standardized examination will score at or above the National 50th percentile.

  2a.   **Summary of Assessment Data Collected:** One student graduated, and took the Major Field Test with score 162.

  2a.   **Use of Results to Improve Instructional Program:** The current national distribution data has not been released. According to the past practice, this is below the national 50th percentile. To improve the result, we will offer a one-credit review section for graduating students.

Second Means of Assessment for Outcome Identified Above:

  2b.   **Means of Program Assessment & Criteria for Success:** Exit survey will be conducted with graduating seniors. The survey will include questions asking the students' perception of their own achievement pertaining to the intended outcomes; each response will be in a scale of 0 to 4, and average of 3.0 points or better for the responses to the relevant questions will be considered satisfactory.

  2b.   **Summary of Assessment Data Collected:** Students are not quite comfortable writing a short essay on a mathematical topic.

  2b.   **Use of Results to Improve Instructional Program:** We will specify some courses as "Writing Intensive Courses" that specifically address students' writing, and we will reorganize the degree plans and move some of the writing intensive courses to earlier years in the degree plans so that students will have more time to develop their writing skills. We also recommend that each mathematics instructor incorporates some writing projects in the courses, and we will create a database for such projects to facilitate exchange of ideas and information among instructors.

Third Means of Assessment for Outcome Identified Above:

 2c. **Means of Program Assessment & Criteria for Success:** Final exams of each of the 3000-4000 level courses will be reviewed by the instructor with regard to the students' writing skill, and each exam paper will be given a point in a scale of 0 to 4. The class average of 2.5 point is considered satisfactory. Instructor will look at students' ability to present solutions or proofs in a coherent and readable manner.

 2c. **Summary of Assessment Data Collected:** The average was 2.2 in 4-point scale.

 2c. **Use of Results to Improve Instructional Program:** We will specify some courses as "Writing Intensive Courses" that specifically address students' writing, and we will reorganize the degree plans and move some of the writing intensive courses to earlier years in the degree plans so that students will have more time to develop their writing skills. We also recommend that each mathematics instructor incorporates some writing projects in the courses, and will create a database for such projects to facilitate exchange of ideas and information among instructors.

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__3__   Students will be able to undertake independent work, explore ideas, discover mathematics and develop correct mathematical arguments and proofs of their discoveries.

First Means of Assessment for Outcome Identified Above:

__3a.__ **Means of Program Assessment & Criteria for Success:** Graduating students will be required to take part in a pilot study program towards the end of their final semester of studies by taking the Major Fields Test in mathematics by ETS; 70% of the students taking the standardized examination will score at or above the National 50th percentile.

__3a.__   **Summary of Assessment Data Collected:** One student graduated, and took the Major Field Test with score 162.

__3a.__   **Use of Results to Improve Instructional Program:** The current national distribution data has not been released. According to the past practice, this is below the national 50th percentile. To improve the result, we will offer a one-credit review section for graduating students.

Second Means of Assessment for Outcome Identified Above:
__3b.__   **Means of Program Assessment & Criteria for Success:** Exit survey will be conducted with graduating seniors. The survey will include questions asking the students' perception of their own achievement pertaining to the intended outcomes; each response will be in a scale of 0 to 4, and average of 3.0 points or better for the responses to the relevant questions will be considered satisfactory.

__3b.__   **Summary of Assessment Data Collected:** Students are generally not comfortable writing proofs, especially if they have to be constructed from scratch.

3b. **Use of Results to Improve Instructional Program:** We will reorganize the degree plans and move some of the proof intensive courses to earlier years of the degree plans so that students will have more time to develop their proof related skills. We also recommend that each mathematics instructor incorporates some proof projects in the courses, and that some of the projects have an element of experiment and/or exploration. We will create a database for such projects to facilitate exchange of ideas and information among instructors.

Third Means of Assessment for Outcome Identified Above:
3c. **Means of Program Assessment & Criteria for Success:** The Senior Project course will be required of students in this program. The mathematics faculty will review jointly the evaluations of students' performance received from the course instructor, to determine whether the students have achieved the intended outcome. An average of 2.5 on a 4-point scale will be considered satisfactory.

3c. **Summary of Assessment Data Collected:** No student was eligible to pursue a senior project this semester.

3c. **Use of Results to Improve Instructional Program:** The program faculty could not make recommendations at this time.

SUPPORT DOCUMENTATION

SOURCE	LOCATION/Special Instructions