

**Texas A&M International University
Core Curriculum Institutional Effectiveness Review (CCIER)**

Core Curriculum Academic Discipline: MATHEMATICS

Assessment Period Covered: Sept. 1, 2010 to May 31, 2011

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The Core Curriculum Institutional Effectiveness Review supports the following imperative of the Texas A&M International University 2011-2015 Strategic Plan:

Imperative 3: Teaching and Learning-- Enhance the educational environment by promoting excellence in teaching and learning.

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.

Core Curriculum Mission

At Texas A&M International University, the Core curriculum introduces students to academic disciplines which form the foundation of human thought: mathematics, science, history, language, literature, the arts, and social and behavioral sciences. Our Core is conceived to open new areas of learning for our students and to foster skills necessary for success in higher education.

As they move through this course of study, students are encouraged, as their knowledge increases, to develop the capacity to articulate and support a thesis, to think critically, to synthesize their observations and to perceive analogies and relationships between seemingly diverse ideas and intellectual pursuits.

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

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.

The Department of Engineering, Mathematics, and Physics assessed during the 2009-2010 period the following outcomes.

2. To represent and evaluate basic mathematical information verbally, numerically, graphically, and symbolically.

5. To interpret mathematical models such as formulas, graphs, tables and schematics, and draw inferences from them.

A proctored quiz containing 12 questions was given to students. The aggregate score in questions 1, 2, 4, 5, 6 and 11 is used to assess outcome number 2 and the aggregate score in questions 3, 7, 8, 9, 10 and 12 is used to assess outcome number 5.

Results of the quiz are as follows. A total of 221 total quizzes have been reported. The percentage of students that obtained a C (70%) or better on outcome 2 was 92%, while the percentage of students that obtained a C (70%) or better on outcome 5 was 54%.

The average data shows that students have a strong grasp of how to represent and evaluate basic mathematical information verbally, numerically, graphically, and symbolically, but are weak on their ability to interpret mathematical models such as formulas, graphs, tables and schematics, and draw inferences from them.

More emphasis needs to be put in the interpretation of mathematical models, graphs, tables and schematics, as well as draw inferences from them, and a plan needs to be developed to improve the performance of students in this outcome. At the same time, it is necessary to maintain a similar level of performance in outcome 2. We believe that a 70% achievement of the outcome is a reasonable benchmark since this number is near the passing rate for this class.

The Department College Algebra Committee will create a plan to address the spotted weakness on outcome number 5 in the Fall 2010 semester. Changes that are deemed necessary may begin to be addressed in Spring 2011. The success of the plan will be evaluated each semester thereafter, until the benchmark has been met at least for 3 consecutive semesters.

We will also consider splitting the assessment of each outcome into individual quizzes, to avoid

problems whose solutions depend on having solved other parts of a question, or other questions correctly. This may have contributed to the low achievement in outcome 5. Care will also be taken to ensure that all each question in each quiz measures one and only one outcome.

Texas Higher Education Coordinating Board Exemplary Educational Objectives for the following academic discipline: MATHEMATICS

1. To apply arithmetic, algebraic, geometric, higher order thinking, and statistical methods to modeling and solving real world situations.
2. To represent and evaluate basic mathematical information verbally, numerically, graphically, and symbolically.
3. To expand mathematical reasoning skills and formal logic to develop convincing mathematical arguments.
4. To use appropriate technology to enhance mathematical thinking and understanding to solve mathematical problems and judge the reasonableness of the results.
5. To interpret mathematical models such as formulas, graphs, tables and schematics, and draw inferences from them.
6. To recognize the limitations of mathematical and statistical models.
7. To develop the view that mathematics is an evolving discipline, interrelated with human culture, and understand its connections to other disciplines.

Section I: Planning and Implementation

Outcome(s):

From the list above, identify the outcome(s) that will be focused upon this year. (It is recommended that academic disciplines rotate through their entire set of Exemplary Educational Objectives over a multi-year period. Thus, disciplines are encouraged to focus only on a few outcomes each year.) To facilitate the completion of this report, please refer to the Core Curriculum Matrix completed for each academic discipline.

The Department will assess outcomes 1 and 3; namely

1. To apply arithmetic, algebraic, geometric, higher order thinking, and statistical methods to modeling and solving real world situations.
3. To expand mathematical reasoning skills and formal logic to develop convincing mathematical arguments.

Please indicate if the outcome(s) is (are) related to writing (Write-On TAMIU).

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.

Students enrolled in MATH 1314 (College Algebra) will be given a pre-test to measure competency in each outcome. The pre-test will be common to all sections of MATH 1314 and will be designed by a committee of instructors of the course. The pre-test quiz will be given during the fourth week of classes. A post-test will be designed and offered during the last week of classes.

Indicate when assessment(s) will take place:

Assessment will take place on Spring 2011.

Criteria/Benchmark(s) for assessing students' progress in meeting the exemplary objective(s) selected:

For each outcome, from pre-test to post-test there will be an increase of at least 15% in the percentage of students that pass (obtain a C or above) with a minimum of 60% of students that pass the post-test.

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) suggested by the results.

We have collected partial data from a sample of 228 students for the pretest out of a total of 361 students enrolled in the course. The report below shows the results for sections where both pre and post test results were available at the time that this report was prepared. For the post test report, the number of students differs from the number of students that took the pre test due to withdrawals from the course or students missing one of the tests (either pre or post test). For the sections that reported the data, we report the aggregate results below. Due to the way data was reported by instructors, we cannot eliminate data of students that did not take one of the tests, but since the reduction in the size of the sample is about 10%, we believe that the data that we have can be used to compare progress in these outcomes, and rate its success or failure.

Results Assessment MATH 1314		
Educational Objective	Percentage of Students that passed the Pre-Test (C or above)	Percentage of Students that passed the Post-Test (C or above)
1. To apply arithmetic, algebraic, geometric, higher order thinking, and statistical methods to modeling and solving real world situations.	30% (68 out of 228)	89% (180 out of 203)
3. To expand mathematical reasoning skills and formal logic to develop convincing mathematical arguments.	9% (21 out of 228)	71% (145 out of 203)
5. To interpret mathematical models such as formulas, graphs, tables and schematics, and draw inferences from them.	6% (14 out of 228)	73% (149 out of 203)

We will continue to collect data and do a better effort to collect 100% of the data in the class.

What were the conclusions reached?

Include a brief description of the conclusion(s) based on the evidence collected and describe the process used to disseminate the information. Use the Meeting Minutes template found at: <http://www.tamtu.edu/adminis/iep/resources.shtml>. Once completed, submit the minutes to integrate@tamtu.edu.

The table shows that most students have successfully mastered each of the assessed outcomes this semester. The difference in the sizes of the samples does not make a difference in rating the success in each outcome. Even in the case that there was 100% failure rate in the post test for the 25 students for which data is missing, all outcomes would have a passing rate of at least 64% (objective 1: 79%, objective 2: 64% and objective 3: 66%).

Describe the action plan formulated.

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

Most students successfully completed the assessment for objectives 1, 3 and 5. We have to continue to emphasize these topics in College Algebra in similar ways in upcoming years. Even if we do not assess these outcomes during the next cycle, we believe that if we continue the same type of activities related to them in College Algebra, students will master them successfully.

In the future we will make a better effort to collect results of both pre and post tests for the analysis of data.

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)

N/A

Date Report Submitted:

Section I, November 4, 2010
Revision Section I, November 8, 2010
Section II and III. May 20, 2011.

