

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

**Program: Bachelor of Arts with a Major in Physical Science**

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

**Program Coordinator (Preparer of Report) Dr. Qingwen Ni**

**List Other Program Faculty:**

<b>Dr. Juan H. Hinojosa</b>
<b>Dr. Qingwen Ni</b>

**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 assessed during the 2008 cycle and outcome related to preparing students for success in their chosen careers. The study showed that 75% successfully completed their reports. This was 5% over the benchmark. As a result, no changes were suggested or implemented.

**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 Physical Science or related field.
4. Students will have a solid foundation in the concepts of Classical Mechanics, Electromagnetic Theory, and Modern Physics, and have the basic and the advanced experimental skills in group and individual setting.
5. Students will have the knowledge of analytical reasoning and problem-solving in the physical sciences. With this knowledge and the experimental skills students will be prepared for a career in the physical sciences.

**Section I: Planning and Implementation**

**Outcome(s)**

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

5. Students will have the knowledge of analytical reasoning and problem-solving in the physical sciences. With this knowledge and the experimental skills students will be prepared for a career in the physical sciences.

**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.*

A lab report in PHYS 2126, University Physics II Lab, will be collected and reviewed according to a rubric which is attached to this document.

**Indicate when assessment(s) will take place**

Spring 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.]*

66% of the students will obtain a grade of 3 or above using the rubric that is attached to this document.

**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.*

During the spring semester a lab report was collected from the students in this degree enrolled in PHYS 2126, University Physics II Lab. The reports were shared with the Assessment Committee and evaluated by their members according to the rubric attached to this document. 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 score given to the reports by members of the Assessment Committee.

	Physics Theory	Data Analysis	Questions Answered	Equipment Use/Set up	Data Recorded	Overall Report	Average
1	4	3	3	3	3	3	<b>3.2</b>
2	4	4	4	4	3	4	<b>3.8</b>
3	4	3	3	3	3	4	<b>3.3</b>
4	4	3	3	3	3	3	<b>3.2</b>
5	4	3	3	4	3	3	<b>3.3</b>
6	3	3	0	4	4	2	<b>2.7</b>
7	3	4	0	4	4	3	<b>3</b>
8	4	4	2	4	4	3	<b>3.5</b>
9	3	3	0	4	4	2	<b>2.7</b>
10	3	4	0	4	4	3	<b>3</b>

11	4	2	2	4	2	3	<b>2.8</b>
12	4	2	3	4	2	2	<b>2.8</b>
13	3	2	1	4	4	1	<b>2.5</b>
14	3	0	4	2	3	1	<b>2.2</b>
15	0	1	1	4	4	1	<b>1.8</b>
Average	<b>3.3</b>	<b>2.7</b>	<b>1.9</b>	<b>3.7</b>	<b>3.3</b>	<b>2.5</b>	<b>2.92</b>

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 8 out of 15 students (53%) reached the intended goal.

The data above shows that students do understand the physics theory necessary to perform their experiments, and that they are comfortable with equipment use as well as with recording data. The data also reveals that students score below 3.0 in the categories of "Data Analysis", "Questions Answered" and "Overall report".

#### **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](mailto:assessment@tamtu.edu).*

Laboratories must emphasize all areas in which assessment is being conducted, and therefore time for the lab should be dedicated to discussion of items such as data analysis, answering questions and writing an overall report.

#### **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.*

For Overall Report students will be reminded every lab to follow the given lab report template. Emphasis will also be given to the Question Answered section on a regular basis during the semester. Finally for Data Analysis, students will be reminded to convert units correctly, and use formulas appropriately, including error analysis.

### 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](mailto:integrate@tamiu.edu).

Updated 09/03/2009