ACADEMIC PROGRAM ASSESSMENT OF STUDENT LEARNING

Phase 2 Report, 2010-2011

College: Arts and Sciences
Program: Undergraduate Major
Degree Granted: B.S.

If multiple programs are included, please list additional programs here (graduate & undergraduate must be separate):
Check one: Undergraduate  X  Graduate

Person Completing Report: Dante DeBlassie
Office Phone: 646-1308
Title: Professor and Chair of Majors and Minors Committee
E-Mail: deblass@nmsu.edu

Department Head: Joseph Lakey
Office Phone: 646-3901
E-Mail: jlakey@nmsu.edu

Check one: Fall Implementation Schedule  X  Spring Implementation Schedule

External Accrediting Agency (if applicable)

Date of last accreditation site visit
Date of next accreditation site visit

***Attach copies of Rubric***

DIRECT STUDENT LEARNING OUTCOME: Students who complete the B.S. in Mathematics will be able to clearly express a written mathematical argument.

COMPONENTS OF THE OUTCOME: Clarity of written expression, completeness of a mathematical argument, appropriate use of logic.

ASSESSMENT DATA:

When did the assessment take place? At the end of the spring semester, 2011.

How many students participated in the assessment process? 12

Please report student performance scores: Scores are from 1 to 10

<table>
<thead>
<tr>
<th>Course/Score</th>
<th># of zeros</th>
<th># of ones</th>
<th># of twos</th>
<th># of threes</th>
<th># of fours</th>
<th># of fives</th>
<th># of sixes</th>
<th># of sevens</th>
<th># of eights</th>
<th># of nines</th>
<th># of tens</th>
<th>Total students</th>
</tr>
</thead>
<tbody>
<tr>
<td>392</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>472</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
</tbody>
</table>
**What percentage of students obtained the desired level of performance?** Math 392: 100%; Math 472: 37.5%

**Does the percentage of students who obtained the desired level of performance meet the program’s stated benchmark?** Math 392: yes; Math 472: no.

**INTERPRETATION:**

*Discuss how the data provides evidence that the desired level of performance on the stated learning outcome is or is not being achieved by students.* We asked the instructors of Math 392 (Introduction to Ordinary Differential Equations) and Math 472 (Fourier Series and Boundary Value Problems) to include a 10-point course-specific problem on their final exams. The problems were designed by the Majors and Minors Committee. We were looking for at least 2/3 of the students to get 6 or better in Math 392 and 2/3 of the students to get 7 or better in Math 472. The 392 is the prerequisite for Math 472 and it is an algorithmic-style course in which the students learn basic ideas, tools and techniques in differential equations. We collected data from it to check if our students have mastered that material because it is crucial for successful completion of 472. The 472 requires synthesis of the material from 392 with higher-level ideas and multistep, complicated problems. In doing so, the students must write in a mathematical fashion that is complete, clear and logical—exactly the components we are assessing in our outcomes.

*Discuss how the data provides meaningful information/evidence to the program that can be used in decision-making and structuring of future learning opportunities.* The results from the 392 course support the view that our majors are having no trouble learning the basic ideas and methods in ordinary differential equations. The results from 472 indicate our majors are having some difficulty making the transition from algorithmic-style courses to those requiring a higher level of thought and understanding. Please note this is a very common problem in all mathematics departments. The particular nature of the problem we gave for 472 indicates to us that the students need additional practice in carrying out long and complex calculations. This is not unexpected because 472 is a course in which many of our students see this for the first time.

**FACULTY DISCUSSION & IMPACT:**

*When did your faculty have a discussion about the results of your assessment?* The faculty discussed the results at a meeting on August 31, 2011.

*What issues did your faculty discuss in relation to the results of your assessment?* The question was raised why we chose the sequence Math 392, Math 472. The answer is that this is just a first step in our ongoing assessment process. Other natural sequences will be assessed as time goes on and the bugs are worked out of our procedure.

*Did the data you collected really answer the question you had about the intended outcome? If not, why?* Yes.

*If data indicates a need for increased learning of the intended outcome, what steps will be taken by the program to foster increased learning of the outcome?* We plan to implement additional training and practice in making complex computations in the next offering of 472.
If interventions are implemented, when will you reassess this outcome to determine whether or not interventions were effective? We will assess the interventions in the next assessment cycle.

If data indicates students are achieving the desired performance level on the intended outcome, is there anything that the program learned about the intended outcome? Will any changes be made?

Assessment Process:

How effective was your assessment process? We feel the process was quite effective, especially since it posed very little inconvenience to the participating faculty members. There was very little resistance to our request that our problems be included on the final exams.

How will what you found this year affect what you do in assessment next year? We will do the same thing.

How have your assessment findings been communicated to the students in your program? They have not yet been communicated to our students.

Are your assessment Phase Reports or another form of reporting on your assessment activities available to your constituents? How? Yes, the activities are available at the department’s internal website.

If on the internet, please provide website: http://sierra.nmsu.edu/dept/

Click on the Reports link.