Fall 2013 SLO/PLO ASSESSMENT REPORT - MATH

Date:

Name of Person Reporting: Dr. Robert Smazenka, Debby Wong, Tigran Mkrtchyan

Name of Department and/or Discipline: Mathematics/CSIT/Engineering

1. What courses/certificates/programs have you assessed this past semester?

<table>
<thead>
<tr>
<th>Course</th>
<th>#SLOs</th>
<th>Assessed</th>
<th>SLO1</th>
<th>SLO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 112</td>
<td>2</td>
<td>Fall 2013</td>
<td>Fall 2013</td>
<td>Fall 2013</td>
</tr>
<tr>
<td>Math 123C</td>
<td>1</td>
<td>Fall 2013</td>
<td>Fall 2013</td>
<td>Spring 2012</td>
</tr>
<tr>
<td>Math 125</td>
<td>2</td>
<td>Fall 2013</td>
<td>Fall 2013</td>
<td>Fall 2013</td>
</tr>
<tr>
<td>Math 240</td>
<td>2</td>
<td>Fall 2013</td>
<td>Fall 2013</td>
<td>Fall 2013</td>
</tr>
</tbody>
</table>

2. Summarize the analysis of your assessment results for the fall semester course assessments in your area. Did the students achieve the established benchmarks (standards for student success)?

Benchmark: The Math department expects 70% of the students to score at least 3 out of 5 points per SLO assessment for achievement of the SLO.

SLO Assessment Analysis

Math 112

Both SLOs were assessed for the Fall of 2013 semester as part of the student final exam. 13 sections of Math 112 provided assessment data for the two SLO parts-SLO1 and SLO2. Instructors assigned to teach Math 112 followed the given rubric for grading each question.

SLO 1

54% of the students earned at least 3 points out of 5 points which is below the expected goal of (70%) set by the math department.

Based on the results shown, almost 46% of the students do not seem to understand the concept of simplifying algebraic expressions adequately. The percentage of students who earned at least 3 points in Fall 2013 is marginally higher than the percentage of students who earned at least 3 points in Spring 2012, which was 51%.
While the results do not necessarily mean poor student performance in the class, they tend to indicate that in general students are having difficulties in problems related to simplifying algebraic expressions. This trend seems to be slightly decreasing (3% less than the Spring 2012 semester). A significant percentage of students getting zero on this question (10.8%), suggesting that many of these students may have provided blank answers. While lack of knowledge is a definite cause for not answering a question, other possibilities include lack of time and student concentration on other (non-SLO) questions of the final exam. A study to confirm or reject these later possibilities requires data on final exam scores which were not available to me at the time of the analysis.

SLO 2

64.8% of the students earned at least 3 points out of 5 points which is below the expected goal of (70%) set by the math department.

Based on the results shown, 35.2% of the students do not seem to adequately understand the concept of simplifying expressions containing fractions.

The most significant percentage of students (42.28%) got 5 points on this question. The second most significant percentage (17.59%) got zero on this question, suggesting that many of these students may have provided blank answers. While lack of knowledge is a definite cause for not answering a question, other possibilities include lack of time and student concentration on other (non-SLO) questions of the final exam. A study to confirm or reject these later possibilities requires data on final exam scores which were not available to me at the time of the analysis.

Math 123C

There were two sections of Math 123C offered in Fall 2013. Those sections answered the required question for assessing SLO 1 on their final exam. The question was graded according to the given rubric.

SLO 1

The results were close to the department’s goal of 70%, however they did fall just short which prompted some changes to the Math 123 sequence.

Math 125

7 out of 15 Sections of Math 125 opted to participate in a pilot common final and therefore participated in SLO assessments. Two questions per SLO statement were
assessed in all 7 sections of Math 125 through students’ final exam. A rubric was given for grading each question.

**SLO 1**

The overall average for the two questions assessed regarding SLO 1 is 73% which satisfies the expected percentage set by the math department.

**SLO 2**

The overall average for the two questions assessed regarding SLO 2 is 68% which is a little below the expected percentage set by the math department. SLO2 Question 1 is a 2 part question testing on the difference of 2 functions and the composition of 2 functions. Some instructors may not emphasize the two objectives in the same chapter equally. To correct this, the course coordinator can check that both objectives were equally emphasized on homework and practice exams as well as practice final.

**Math 240**

Two questions per SLO statement were assessed for all Math 240 sections of the Fall 2013 through students’ final exam. A rubric was given for grading each question.

**SLO 1**

Based on the good score (88%) obtained for Question 1, calculating a trigonometric function using right-triangle-based definitions, students understand the concept fully. However, Question 2, graphing a trigonometric function with transformations, is 5% below the department expectation. The online homework may not provide enough in-depth thinking about graphing with transformations. Since online answers for graphing are provided in a multiple choice format, students will use educated guess to obtain the correct answer without considering all the steps involved for graphing.

The overall average for the two questions is 76.4% which satisfies the expected percentage set by the math department.

**SLO 2**

The average percentage (68%) for Question 1, solving a trigonometric equation, is slightly below 70%. There are three Math 240 sections - two full-term sections and one short-term section. Students from the two full-term sections actually have approximately 80% average percentage for Question 1 in comparison to 24%
average for the short term section. Students often do not realize the amount of self-discipline and study time required in taking a short term math course. Out of all assessed questions, Question 1 of SLO2 is a challenging one because it required mastering some concepts learned from previous chapters. Due to the outliers from the short-term section, 68% is an acceptable percentage for Question 1. The average percentage (82%) for Question 2, using Laws of Cosine to find an angle, indicates students understand strongly how to apply the formula.

3. Based on the discussion and analysis of your assessment results, what changes have you made or do you plan to make?

**Math 112**

Based on the results and the above analysis, the following measures can be taken to improve student performance as it relates to the first SLO part.

1. More time should be spent explaining all SLO 1 concepts including methods of “Perform operations and simplify numerical and algebraic expression involving integer and rational numbers”
2. More practice exercises should be provided for students.
3. Create worksheets for students.
4. Retest SLO1 right after the concept is taught.
5. Add SLO1 Q1 questions to each practice test as an ongoing review.
6. Test SLO1 Q1 questions in each test.

**Math 123C**

It was felt that while some students were using the help within the courseware to learn, others were relying on it too much and were not really learning the material. For Spring 2014, the courseware will be setup so that not every problem has those help features. This should allow the student to use the help features to get used to the concept at the beginning of an assignment, but force them to do the problems all on their own by the end of the assignment.

**Math 125**

The overall SLO results for Math 125 are satisfactory. However, these results are not reflective of the general Math 125 student population. This semester was the first semester that the SLO question pool questions were sent out to faculty. As faculty become more and more aware of the importance of thoroughly covering the objectives covered, SLO results will improve. The course coordinator will send the SLO question pool to faculty and remind them of the importance of emphasizing the objectives in there. In addition, the online practice final, which contained the same types of questions, needs to be assigned as homework by all faculty and given a bigger chunk of the grade.
Math 240

The overall SLO results are satisfactory. This means the COR, choice of textbook, and the Math240 department outline including the suggested timeline per chapter are adequate. SLO performance can be further improved by using a combination of online and written homework.

Although there are advantages such as algorithmic questions, online tutorial resources, automatic grading, and animation in using online homework assignments, some concepts such as graphing with transformations, verifying identities, and solving trigonometric equations are better served with paper and pencil practice. For these three topics, instructors should consider assigning and grading some written homework in addition to the assigned online homework.

4. Follow up on previous assessments:

(1) If this SLO was assessed previously, compare the results with the earlier assessments. Have the recommended changes been implemented?

(2) How have the findings led to improved student learning and the achievement of the college mission?

Math 112

<table>
<thead>
<tr>
<th>Assessed</th>
<th>Spring 2012</th>
<th>Fall 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLO 1</td>
<td>50%</td>
<td>57%</td>
</tr>
<tr>
<td>SLO 2</td>
<td>57%</td>
<td>73%</td>
</tr>
</tbody>
</table>

More MyMathLab training and workshops were provided to Math 112 instructors. Through the use of MyMathLab more exercises for SLO 1 and SLO 2 were added to the online homework. To increase the awareness of SLO expectations, the department created a pool of Math 112 SLO questions and distributed to all faculty. Through these implementations the results have been improved especially for SLO 2. To provide more academic support, the STEM center operation hours were extended. The combination of MyMathLab online resources and the face-to-face tutorial services in the STEM center led to improved student learning and academic success.

Math 123C

<table>
<thead>
<tr>
<th>Assessed</th>
<th>Spring 2012</th>
<th>Fall 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLO 1</td>
<td>52%</td>
<td>63%</td>
</tr>
<tr>
<td>SLO 2</td>
<td>73%</td>
<td>Not assessed</td>
</tr>
</tbody>
</table>
To increase the awareness of SLO expectations, the department created a pool of Math 123C SLO questions and distributed to all faculty. Through these implementations the results have been improved. To provide more academic support, the STEM center operation hours were extended. The combination of MyMathLab online resources and the face-to-face tutorial services in the STEM center led to improved student learning and academic success.

### Math 125

<table>
<thead>
<tr>
<th>Assessed</th>
<th>Spring 2012</th>
<th>Fall 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLO 1</td>
<td>49%</td>
<td>73%</td>
</tr>
<tr>
<td>SLO 2</td>
<td>44%</td>
<td>68%</td>
</tr>
</tbody>
</table>

The coordinator, Carole Akl, redesigned Math 125 MyLabsPlus setup to provide well selected homework exercises and practice tests which include SLO questions. To increase the awareness of SLO expectations, the department created a pool of Math 125 SLO questions and distributed to all faculty. Since all Math 125 instructors copied Mrs. Akl’s setup and used her sample tests, there is a significant improvement on the results of both SLOs. To provide more academic support, the STEM center operation hours were extended. The combination of Math 125 MyLabsPlus redesign, online resources, and the face-to-face tutorial services in the STEM center led to improved student learning and academic success.

### Math 240

<table>
<thead>
<tr>
<th>Assessed</th>
<th>Fall 2011</th>
<th>Fall 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLO 1</td>
<td>82%</td>
<td>76%</td>
</tr>
<tr>
<td>SLO 2</td>
<td>73%</td>
<td>75%</td>
</tr>
</tbody>
</table>

To strengthen the consistency of concepts learned from Math 125 which are needed to be successful in Math 240, the math department created a common final exam. A MyMathLab coordinator course has been created for instructors to copy then alter to their own course. SLO results have met the department expectations for 2 consecutive years. The setup such as the timing of the course outline and MyMathLab platform meets the department standards. To provide more academic support, the STEM center operation hours were extended. The combination of MyMathLab online resources and the face-to-face tutorial services in the STEM center led to improved student learning and academic success.
5. **How have the results of your assessments been shared and discussed among the members of your program?** (Provide dates and any minutes of meetings as evidence.)

The results have been shared with all full time instructors on a regular basis. The logistics of recommendation/implementation has been planned by designated math faculty per course. A set of common assessed questions is used for all sections per course to ensure the SLO measurements provide non-bias statistical data, thus the coordination for each SLO assessment is labor intensive. One of the major complaints from math faculty was that the questions were not what they expected. To address this problem, the math department has created pools of SLO questions for all developmental math courses and statistics. See attachments for SLO meeting minutes on 05_29_2013, 07_10_2013, 08_20_2013 and 01_15_2013. A memo from the department chair on 08_20_2013 is also attached. All course SLO question pools were emailed to faculty members teaching the course around August 20, 2013. Feedbacks and comments were due by the end of the 2nd week in September, 2013. Each revised SLO question pool was sent out by the end of September, 2013. Trails of emails can be provided upon request.

6. **How have the results of your assessments been shared and discussed with members of your advisory committee (if vocational program)?**

N/A

7. **What resource requests are planned as a result of the assessments?**

The STEM center is currently supported by the STEM grant which will end in two years. The establishment and good reputation of the STEM center takes years to build up. Since most of our students come from low income families, having a place that they feel comfortable asking questions and study with well-trained tutors is an essential part for student success especially for core courses. Historically, LAMC has been using soft money for tutorial services. In order to provide a free academic supportive environment to our students, a portion of the program 100 budget should be allocated to tutorial services. Institutionalizing the STEM center gradually before the end of the STEM grant would show commitment to the college mission.

8. **Have the assessment results been posted on the online system?**

Yes
Written responses to these questions are due by e-mail to the SLO Coordinator Pat Flood by Tuesday, January 21, 2014.