### Course SLO Assessment Report - 4-Column

El Camino College

El Camino: Course SLOs (MATH) - Developmental Math

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<td>El Camino: Course SLOs (MATH) - Developmental Math - ECC: MATH 12 - Basic Arithmetic Skills - SLO #1 Application Problems - Students will be able to recognize addition, subtraction, multiplication, division, exponentiation, factoring and order of operations in a given context (word problem, data, diagram, etc.) involving non-negative real numbers to write corresponding mathematical expressions and solve authentic, real-world application problems. (Created By El Camino: Course SLOs (MATH) - Developmental Math)</td>
<td><strong>Assessment Method Description:</strong> The SLO is a simple proportion problem incorporating a fraction number: &quot;A recipe for two people calls for calls for 2 ¾ cups of sugar, but you want to make enough for 5 people. How many cups of sugar will you need?&quot;</td>
<td><strong>02/07/2014 -</strong> Of the 621 students taking this SLO, 47% of students passed. This is not a satisfactory outcome. This shows that a majority of students in Math 12 are not mastering the topic of proportional word problems incorporating fractional values. More attention needs to be paid to this topic. Of the 466 that passed Math 12, 188 (40%) did not pass the SLO. Of students who passed the course and are persisting to the next math course this SLO shows 40% are doing so without mastery of this topic. Of the 155 that failed Math 12, 140 (90%) failed the SLO. Of students that failed this class, very few of them are being held back with mastery of this topic. If a student failed the class they probably failed the SLO as well.</td>
<td><strong>06/06/2014 -</strong> Research and distribute to current Math 12 instructors teaching strategies recommended by the American Mathematical Association of Two Year Colleges (AMATYC) that pertain to developmental mathematics.</td>
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<td><strong>Course SLO Assessment Cycle:</strong> 2014-15 (Spring 2015)</td>
<td><strong>Assessment Method:</strong> Exam/Test/Quiz</td>
<td><strong>Standard Met? :</strong> No</td>
<td><strong>Activity Category:</strong> Teaching Strategies</td>
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<td><strong>Input Date:</strong> 11/20/2013</td>
<td><strong>Standard and Target for Success:</strong> Rubric for assessing the SLO: A score of 4 or 5 should be considered as satisfactory (passing).</td>
<td><strong>Semester and Year Assessment Conducted:</strong> 2013-14 (Fall 2013)</td>
<td>06/06/2014 - Call a meeting of the Developmental Math Committee to discuss results and create new action plans.</td>
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<td><strong>Course SLO Status:</strong> Active</td>
<td>5 points: The solution is completely correct in its entirety and the student has demonstrated a full understanding of the concepts involved (a) used notation correctly (b) has clearly shown all the steps (c) made no algebraic errors</td>
<td><strong>Faculty Assessment Leader:</strong> Art Martinez</td>
<td>06/06/2014 - Distribute results of this assessment to all instructors of Fall 2013 and to current instructors in Spring 2014.</td>
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<td>4 points: The solution shows that the student has demonstrated a strong understanding of the skill or concepts involved, but has made some minor error. (a) not completely answering the question (b) not using consistent notation (c) making multiple errors in computation</td>
<td><strong>Related Documents:</strong> Math 12 SLO Fall2013.xls</td>
<td><strong>Action Category:</strong> Teaching Strategies</td>
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<td>3 points: The solution demonstrates some conceptual understanding of the skill or concept involved, but has not thoroughly mastered it. One or more major errors are present in the solution: (a) not completely answering the question (b) not using consistent notation (c) making multiple errors in computation</td>
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<td>2 points: The solution demonstrates minimal conceptual understanding of the skill or concept involved. One or more major errors are present in the solution: (a) not completely answering the question (b) showing confused reasoning (c) not using consistent notation (d) making multiple errors in computation</td>
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<td>1 point: The solution demonstrates a very weak</td>
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To understand the skill of concept involved.

0 points

No solution presented

It is expected that 65% of students will score 4 or greater on this SLO.

**El Camino: Course SLOs (MATH) - Developmental Math - ECC: MATH 23 - Pre-Algebra - SLO #3 Visual and Graphical Methods**

- Students will be able to use visual or graphical methods to solve linear equations and problems involving geometry and measurement. (Created By El Camino: Course SLOs (MATH) - Developmental Math)

**Course SLO Assessment Cycle:**
2016-17 (Spring 2017)

**Input Date:**
01/21/2014

**Course SLO Status:**
Active

**Assessment Method Description:**
Given a bar graph showing average monthly temperatures in Alaska, which includes negative temperatures, students were asked to answer the following:

a. In which month is the weather the coldest?

b. What is the difference in temperature between the months of Nov and Dec?

c. What is the difference in temperature between the months of Feb and May?

**Assessment Method:**
Exam/Test/Quiz

**Standard and Target for Success:**
Based on the Rubric below, it is expected that 70% of the students will score 2 or higher on this SLO.

**Rubric:**
0-No understanding. Student answered none of the problem correctly.
1-Some understanding. Student answered a small portion of the problem correctly.
2-Most understanding. Student answered most of the problem correctly.
3-Complete understanding. Student answered all of the problem correctly.

**Standard Met?**
Yes

**Semester and Year Assessment Conducted:**
2013-14 (Fall 2013)

**Faculty Assessment Leader:**
Alice Martinez and Megan Granich

**Faculty Contributing to Assessment:**
Avila, Cortez, Fanelli, Faridpak, Feiner, Ferguson, Formanes, Gill, Granich, Khan, L. Le, D. Le, A. Martinez, Nian, Ornelas, Raffel, Rahnavard, Roach, Skorka, Stoddard, Taylor, Wan, Wong

**Action Category:**
Teaching Strategies

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**El Camino: Course SLOs (MATH) - Developmental Math - ECC: MATH 37 - Basic Accelerated Mathematics - SLO #3 Visual and Graphical Methods**

- Students will be able to use graphical methods to represent linear and quadratic relations and to find solutions for linear and quadratic equations. (Created By El Camino: Course SLOs (MATH) - Developmental Math)

**Course SLO Assessment Cycle:**
2016-17 (Spring 2017)

**Input Date:**
03/19/2014

**Assessment Method Description:**
The nature of Math 37 (BAM), where half of the work is done online in the computer lab and half in the classroom, has inspired the instructors to explore the possibility of using computerized questions to assess SLOs, even though we believe in the long run a variety of assessment techniques will be necessary. All Course SLOs will be assessed using computer based questions for at least the first cycle. It is our way of exploring this type of assessment instrument. In

**Standard Met?**
03/19/2014 - Our results were satisfactory, but slightly disappointing. As expected, more than 90% of our students were able to plot points accurately and identify the correct quadrant. More than 70% of our students were able to identify key characteristics of a line, including the slope, and were able to translate visual information into a reduced ratio. However, only 67% of our students were able to correctly find the domain and range of a function using a graph (with the formula for the function given).

**Action Category:**
Teaching Strategies

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<td>11/20/2013</td>
<td>particular, one of the limitations that we have figured out at this point is how to set up a meaningful rubric these online questions. For the moment, we are focusing on figuring out what can be learned directly from the scores on these questions. The assessment instrument consisted of five computer-based questions which explored objectives related to using graphical and visual methods for problem solving, including finding the slope of a line from a graph; find the domain and range of a function based on a graph; write a ratio based on a visual display; identify key characteristics of the graph of a line; and plotting a point and identifying the quadrant. Assessment Method: Exam/Test/Quiz Standard and Target for Success: Our standard for this assessment was that our students would achieve a 70% success rate on at least three of the five questions.</td>
<td>Yes</td>
<td>Semester and Year Assessment Conducted: 2013-14 (Fall 2013)Faculty Assessment Leader: Lars KjesethFaculty Contributing to Assessment: Eduardo Barajas, Arturo Martinez, Lars Kjeseth, Jose Villalobos, Juan Ortiz, Abigail Tatlilioglu, Laura Hinckley Reviewer's Comments: Specific numbers for this report were misplaced; therefore the sample size and number of students scoring in each category are missing from this report.</td>
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<td>Course SLO Status:</td>
<td>Active</td>
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<td>Assessed SLO: El Camino: Course SLOs (MATH) - Developmental - ECC: MATH 40 - Elementary Algebra - SLO #3 Visual and Graphical Methods - Students will be able to use graphical methods to represent linear and quadratic relations as well as systems of linear relations and to find solutions to linear and quadratic equations, as well as solve systems of linear equations. (Created By El Camino: Course SLOs (MATH) - Developmental Math) Course SLO Assessment Cycle: 2016-17 (Spring 2017)</td>
<td>02/05/2014 - 775 students in 27 sections took part in this assessment. Overall, 31% or 240 of students scored a 3 (full understanding), 30.7% or 238 of students scored a 2 (some understanding), 23.9% or 185 of students scored a 1 (little understanding) and 14.4% or 112 of students scored a 0 (no understanding). Graphing to find a solution was difficult for students. Some were able to solve systems of equations algebraically, but struggled with understanding the graphical relationship. Some instructors stated that they did not teach solving systems using the graphical approach or spent little time teaching this method due to time constraints. This may have cause a lower success rate on this SLO.</td>
<td>05/14/2015 - Increase the target for success from 60% to 65%. Attached are recommended activities that can be used to help teach the graphing method for solving systems of equations. These activities will be sent out with the new SLO question each semester to all instructors teaching Math 40.</td>
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<td>Assessment Method Description: Solving Linear Equations by Graphing. There are two parts to this assessment: •Understanding that the solution is the point of intersection of two lines. •Understanding that the slope of a line determines whether or not a solution exists. Students are given two questions addressing each of these topics. Assessment Method: Exam/Test/Quiz Standard and Target for Success: 60% of students score a 2 or a 3 indicating understanding that the solution of a system is found where two lines interest, and that the slopes of the lines determine whether lines are parallel. Related Documents: M40 SLO F13 proposed.docx</td>
<td>Standard Met? : Yes</td>
<td>Semester and Year Assessment Conducted: 2013-14 (Fall 2013)Faculty Assessment Leader: Anna HockmanFaculty Contributing to Assessment: Bucher, Taylor, Feiner, Avakyan, Morles, Gill, Ferguson, Khorram, Downer, Yee, Fanelli, Valle, C. Nguyen, Roach, Zambrano, Stoddard, Niang, Rahnavard, CarterRelated Documents: Activity_17_Exploring_Systems_by_Gr</td>
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<td>Action Category: Teaching Strategies Follow-Up: 04/12/2014 - Recommended activities for solving systems of equations using the graphical approach were sent out along with the SLO questions for Spring 2014 to all instructors teaching Math 40.</td>
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<td>El Camino: Course SLOs (MATH) - Developmental Math - ECC: MATH 60 - Elementary Geometry - SLO #3 Visual and Graphical Methods - Students will be able to construct geometric shapes using the compass and straightedge. (Created By El Camino: Course SLOs (MATH) - Developmental Math)</td>
<td><strong>Assessment Method Description:</strong> Students will be given an obtuse triangle and will be asked to construct an altitude for the given triangle. The altitude will be constructed from one of the acute angles of the triangle. <strong>Assessment Method:</strong> Exam/Test/Quiz</td>
<td><strong>02/05/2014 - MATH 60 – All sections – Fall 2013 - Data</strong>&lt;br&gt;MATH 60 - Sections 0390, 0392, 0394&lt;br&gt;Teachers: S. Tummers, A. Minasian&lt;br&gt;Pass Class - SLO Pass: 41&lt;br&gt;No Pass Class - SLO Pass: 2&lt;br&gt;Pass Class - NO SLO Pass: 13&lt;br&gt;No Pass Class - NO SLO Pass: 9</td>
<td><strong>05/08/2015 - Distribute SLO material to Math 60 instructors earlier in the semester.</strong>&lt;br&gt;<strong>Action Category:</strong> Teaching Strategies</td>
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<td><strong>Course SLO Assessment Cycle:</strong> 2016-17 (Spring 2017)</td>
<td><strong>Standard and Target for Success:</strong> It is expected that 75% of all students will receive an Excellent or Satisfactory on the SLO.</td>
<td><strong>Total Students who attempted SLO = 65</strong>&lt;br&gt;Excellent = 31 30 of these students passed&lt;br&gt;Satisfy = 12 11 of these students passed&lt;br&gt;Needs Improvement = 2213 of these students passed</td>
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<td><strong>Input Date:</strong> 11/20/2013</td>
<td><strong>Standard Met? :</strong> No</td>
<td><strong>Only 66% of the students received an Excellent or Satisfactory on the SLO.</strong></td>
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<td><strong>Course SLO Status:</strong> Active</td>
<td><strong>Semester and Year Assessment Conducted:</strong> 2013-14 (Fall 2013)</td>
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<td><strong>Faculty Assessment Leader:</strong> S. Tummers</td>
<td><strong>Related Documents:</strong> Math 60 Rubric for SLO #3</td>
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<td>El Camino: Course SLOs (MATH) - Developmental Math - ECC: MATH 67 - General Education Algebra - SLO #3 Visual and Graphical Methods - Students will use visual and graphical methods to represent, analyze and solve contextualized problems involving authentic, real-world data. (Created By El Camino: Course SLOs (MATH) - Developmental Math)</td>
<td><strong>Assessment Method Description:</strong> The assessment is an SLO Quiz with several problems corresponding to different SLO's. Problem 2 on the quiz was used for SLO#3. See attached.</td>
<td><strong>02/07/2014 - Of the 88 students, 25% scored 3 (excellent), 50% scored 2 (satisfactory), 11% scored 1 (less than satisfactory) and 14% scored zero. We used an &quot;SLO quiz&quot; which has multiple problems corresponding to different SLO's. For SLO#3, we used problem #2 on the quiz. See attached.</strong>&lt;br&gt;<strong>Standard Met? :</strong> Yes</td>
<td><strong>06/30/2014 - Increase the student engagement for the course. Include more student activities.</strong>&lt;br&gt;<strong>Action Category:</strong> Teaching Strategies</td>
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<td><strong>Course SLO Assessment Cycle:</strong> 2016-17 (Spring 2017)</td>
<td><strong>Assessment Method:</strong> Exam/Test/Quiz</td>
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<td><strong>Input Date:</strong> 11/20/2013</td>
<td><strong>Standard and Target for Success:</strong> It is expected that 70% of students will score 2 or better. The scale is 3-correct (excellent), 2-mostly correct (satisfactory), 1-some correct (less than satisfactory), 0-nothing correct.</td>
<td><strong>Faculty Assessment Leader:</strong> Susan Taylor</td>
<td><strong>06/30/2014 - Increase the degree of difficulty of assessments and material related to SLO#3.</strong>&lt;br&gt;<strong>Action Category:</strong> Curriculum Changes</td>
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<td><strong>Course SLO Status:</strong> Active</td>
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<td><strong>Faculty Contributing to Assessment:</strong> Sue Bickford, Russell Reece, Gaythri</td>
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<td>Related Documents: &lt;br&gt;Math 67 SLO Quiz</td>
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<td>Manikandan</td>
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<td>Related Documents: &lt;br&gt;Quiz09_SLO (1).docx</td>
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**Course SLO Assessment Cycle:** 2016-17 (Spring 2017)  
**Input Date:** 11/20/2013  
**Course SLO Status:** Active

**Assessment Method Description:**  
See attached:  
SLO QUESTION  
1. The value of a car depreciates as shown by the graph below.  
a) What was the purchase price of the car?  
b) Approximately how much is the car worth after 8 years?  
c) Approximately how long does it take until the car is worth $14,000?  

**Assessment Method:** Exam/Test/Quiz  
**Standard and Target for Success:**  
Based on the rubric, it is expected that 60% of students will receive a 2 or higher on this SLO.  
**Related Documents:** Math 73 SLO Fall 2013 SLO.docx

**04/30/2014 - Provide more support for course development and improvement.**  
Provide better facilities in computer lab (the computer desks and most of the transponders are broken). Provide a better registration process for students. This semester and last semester students were not able to register online since the prerequisite check was not operating properly.  
**Action Category:** Program/College Support

**04/30/2014 - Change the assessment instrument to match the increased level of challenge.**  
**Action Category:** SLO/PLO Assessment Process

**01/18/2014 - A total of 975 students taking Math 73 were assessed. Of the 975 total results and with a rubric of 0 - 3, 31 students received a 0, 75 received a score of 1, 245 received a score of 2, and 620 scored a 3.**  
Out of 3 points, 3% received a 0, 8% received a 1, 25% scored 2, and 64% scored 3. This tells us 89% of students received a score of 2 or higher.  
This shows that our students have an ability to read a graph and answer questions about the graph. Our students have had many opportunities to read various types of graphs and respond to questions related to the graph in both class and for homework.  
A total of 38 sections were assessed. According to the online register, only 37 are listed. After analyzing the results given, there are four sections listed from "Abbassi" but according to the online register there are only two sections from this instructor. All results have been counted in the numbers listed.  
**Participating Instructors:** Ambika Silva, Alice Martinez, Kasabian, Malinni Roeun, Evan Skorka, Trudy Meyer, Aban Seyedin, tavakkli, Michael Bateman, Mohammad H. Rahnavard, Tadele, Ronny Alpern, Bickford, Saakian Lernik, Sheynshteyn, don roach, Jasmine Ng.

**05/20/2017 - Raise the target for success rate from 60% to 75%**  
**Action Category:** SLO/PLO Assessment Process
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**Assessment Method Description:**
The assessment instrument selected for this SLO was an exponentially decaying curve that modeled the value of a 2013 model vehicle as a function of ‘t’ years after 2013. Students were given the graph and then were asked three free response questions to demonstrate that they were capable of properly interpreting and identifying key aspects of the graph. The first question asked students to find the purchase price of a new 2013 model vehicle. This question required students to accurately identify and interpret the vertical axis intercept point of the graph. The second question asked students to approximate the value of the 2013 model vehicle in the year 2016. This question required that students accurately interpret the year 2016 as the value of t=3 on the graph and then find the corresponding value on the graph. The third and final question asked students to determine in which year a 2013 model vehicle is expected to lose exactly half of its original value. This question required students to select the correct vehicle value along the vertical axis (the range) and then read the graph “backwards” to find the corresponding value along the horizontal axis (the domain). The Rubric for this assessment was on a scale of 0 to 3; where the score directly correlated to the number correct answers each student provided. **Assessment Method:** Exam/Test/Quiz

03/20/2014 - The assessment instrument selected for this SLO was an exponentially decaying curve that modeled the value of a 2013 model vehicle as a function of ‘t’ years after 2013. Students were given the graph and then were asked three free response questions to demonstrate that they were capable of properly interpreting and identifying key aspects of the graph. The first question asked students to find the purchase price of a new 2013 model vehicle. This question required students to accurately identify and interpret the vertical axis intercept point of the graph. The second question asked students to approximate the value of the 2013 model vehicle in the year 2016. This question required that students accurately interpret the year 2016 as the value of t=3 on the graph and then find the corresponding value on the graph. The third and final question asked students to determine in which year a 2013 model vehicle is expected to lose exactly half of its original value. This question required students to select the correct vehicle value along the vertical axis (the range) and then read the graph “backwards” to find the corresponding value along the horizontal axis (the domain). The Rubric for this assessment was on a scale of 0 to 3; where the score directly correlated to the number correct answers each student provided. With the participation of 8 instructors, including 10 sections, and 199 students the following data was gathered; 14 out of the 199 (5.86%) students were not able to accurately answer any of the questions and earned a ‘0’, 32 out of the 199 (13.39%) students were able to accurately answer only 1 question and earned a ‘1’, 71
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**Standard and Target for Success:**

out of the 199 (29.71%) students were able to accurately answer 2 out of the 3 questions and earned a ‘2’, and finally 83 out of the 199 (34.73%) students were able to accurately answer all 3 questions and earned a ‘3’. Our results indicates that 154 of the 199 (77.39%) students either earned a perfect score or missed only 1 question and so the general sentiment expressed by several instructors is that they were “pleased” with the results. A couple instructors interpreted their student’s results as evidence that “they are learning and making progress”. To improve student understanding of this topic, one instructor expressed his intention to analyze more graphs that model real world applications.

**Standard Met? :**

Yes

**Semester and Year Assessment Conducted:**

2013-14 (Fall 2013)

**Faculty Assessment Leader:**

Eduardo J Barajas, Jeff Cohen

**Faculty Contributing to Assessment:**

J. Villalobos, Tavakkoli, Zekarias Dammema, Ronny Alpern, Robert Horvath, Miguel Ornelas, Allen Sampson, Linda Ho

**Reviewer’s Comments:**

I was disappointed that such a low number of instructors participated in the assessment. Next semester I will make a stronger effort to underscore the value of this assessment.