Assessment: Course Four Column

SPRING / SUMMER 2016

El Camino: Course SLOs (MATH) - Developmental Math

ECC: MATH 12:Basic Arithmetic Skills

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
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. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** The SLO is a simple proportion problem incorporating a fraction number: "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?" **Standard and Target for Success:** Rubric for assessing the SLO: A score of 4 or 5 should be considered as satisfactory (passing). 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 4 points The solution shows that the student has demonstrated a strong understanding of the skill or		

Course SLOs	Assessment Method Description	Results	Actions
	concepts involved, but has made some minor error. 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 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 1 point The solution demonstrates a very weak understanding of 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. **Exam/Test/Quiz -** Given a menu and an order at a fast food restaurant, students calculate the total cost		

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	before tax (subtotal), the tax (using a tax rate of 10%), and the change received for a given payment. See attached for the specific problem. **Standard and Target for Success:** The problem involves three parts: 1) Calculating the subtotal 2) Calculating the tax 3) Calculating the change Students earn 1 point for each correct part. Scores of 2 or 3 are considered passing. Target for Success is that 70% of students earn a score of 2 or 3. **Related Documents:** Math 12 SLO-1 Spring 15.pdf		
SLO #2 Solving Equations and Manipulating Expressions - Students will be able to use numerical and symbolic representations to correctly perform operations (addition, subtraction, multiplication, division, exponentiation, factoring, and order of operations) on non-negative real numbers to simplify expressions. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** The planned SLO is a common topic in arithmetic: Order of Operations. An arithmetic problem with 5 operations was presented to students; they were given points based on the proportion of operations they performed in the correct order. Assessment: Solve by describing each step following the proper order of operations: 28 - 3(15 ÷ 5 - 1)3 Step 1: Step 2: Step 3: Step 4: Step 5:		

Course SLOs	Assessment Method Description	Results	Actions

Final Answer: 28 - 3(15 ÷ 5 - 1)3 =

_____

Standard and Target for Success:
Standards or Rubric

3 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
2 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
1 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
0 points No solution presented

A passing grade is a grade of 2 or greater.

Course SLOs	Assessment Method Description	Results	Actions
	The target for success is 65%: If 65% of students pass this SLO we will consider this SLO successful.		
SLO #3 Visual and Graphical Methods - A student completing Pre-Collegiate mathematics will use visual and graphical methods to represent and analyze information and to solve problems using non negative real numbers, including demonstrating correct ordering of values and testing reasonableness of solutions. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2016-17 (Spring 2017) **Input Date:** 11/20/2013			
SLO #4 Articulating Mathematical Reasoning - A student completing Pre collegiate mathematics will verbally articulate (orally or in written form) the mathematical reasoning they used to solve a problem or analyze a situation. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** The SLO is an Order of Operations problem that was performed incorrectly. The students will need to recognize and describe the mistakes and then do the problem correctly: Original Problem: Simplify the expression: 8+2(7-4)-12 The student's incorrect answer was: 8+2(7-4)-12 8+2(3)-12 10(3)-12 30-12	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met • Of the 213 students taking this SLO, 153 (72%) received a score of 3 and 39 (18%) received a score or 2. This means that 90% of students completed the SLO with a passing score. This is a satisfactory outcome. This shows that a majority of students in Math 12 are mastering the topic Articulating Mathematical Reasoning. • In these sections of Math 12, 74% of the students passed the class and 26% were not successful. When compared to the SLO success rate of 90%, students who are not passing the class are still successfully articulating mathematical reasoning. (09/16/2016) **Faculty Assessment Leader:** Beth Schwartz **Faculty Contributing to Assessment:** T. Malouf, A. El Abyad, H. Feiner, L. Hinckley, A. Minasian, C. Yang, J. Villalobos, A. Ovanessian, and Z. Dammena	**Action:** Introduce the idea of evaluation machines to help students improve their mathematical articulation and description of mathematical processes. (09/16/2017) **Action Category:** Teaching Strategies

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	a. Explain in complete sentences the mistake the student made. b. Simplify the expression correctly. Rubric for assessing the SLO: 3 points – The student gives a complete explanation of the mistake and simplifies the expression correctly. 2 points – The student gives an incomplete explanation of the mistake and simplifies the expression correctly. 1 point – The student gives a vague explanation about the mistake and did not simplify the expression correctly. OR Student simplified the expression correctly and gave no explanation about the mistake. **Standard and Target for Success:** It is expected that 70% of the students will score a 2 or a 3 on this SLO assessment		

ECC: MATH 23:Pre-Algebra

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Application Problems - Students will recognize the underlying mathematical concepts in order to successfully evaluate expressions and formulas in a given context (word problems, data, diagrams, etc.) and apply those concepts correctly in authentic, real-world application problems. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** Students will successfully evaluate expressions and formulas in a given context (word problems, data, diagrams, etc) and apply those concepts correctly in authentic, real-world application problems. The question is a twist of a traditional geometric perimeter problem of a rectangle with one side missing. The problem is attached. **Standard and Target for Success:** The method of grading was a 5 point rubric: 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 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. 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		

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	question (b) not using consistent notation (c)making multiple errors in computation 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 1 point - The solution demonstrates a very weak understanding of the skill of concept involved. 0 points - No solution presented Passing is considered a score of a 4 or 5. Target for success is having 70% of our students pass this problem. **Related Documents:** SP2015-SLO-Math 23 (3)(1).doc		
SLO #2 Solving Equations and Manipulating Expressions - Students will use numerical and symbolic representations of mathematical ideas to simplify linear expressions and solve linear equations. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** Sample Question: Given: (i) 4x +3 – 8 (ii) 4x +3 = 8 A) Which of the above is a linear equation? Which is a linear expression? B) Simplify the linear expression. C) Solve the linear equation.		

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	Standard and Target for Success: Based on the rubric below, it is expected that 70% of the students will score 2 or 3 on this SLO. GRADING RUBRIC (problem worth a maximum of 3 points): Part (A) (worth 1 point) 1 point (student correctly identifies which is an expression and which is an equation) 0 points (student incorrectly identifies which is an expression and which is an equation) Part (B) (worth 1 point) 1 point (student correctly simplifies the expression) 0 points (student makes mistakes simplifying the expression, or treats expression like an equation) Part (C) (worth 1 point) 1 point (student correctly solves the equation) 0 points (student makes mistakes in solving the equation, or treats the equation like an expression) **Related Documents:** Math 23 SLO sample problem		
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. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2016-	**Exam/Test/Quiz -** Given a bar graph showing average monthly temperatures in Alaska, which includes negative temperatures, students were asked to answer the following:		

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17 (Spring 2017) **Input Date:** 01/21/2014	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? **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. **Related Documents:** Math 23 SLO 3 Assessment Problem Fall 13		
SLO #4 Articulating Mathematical Reasoning - Students will verbally articulate (orally or in written form) the mathematical reasoning they used to solve a numeric or linear problem or analyze a numeric or linear situation. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016)	**Exam/Test/Quiz -** Paul tries to solve the equation: 3-2(4x-7)=2. Here is his work: 3-2(4x-7)=2 1-8x-14=2 -7-8x=2	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met 14 Sections & 415 students Passed the SLO / Did Not Pass the SLO Passed the Course: 210 (50%) / 96 (23%) Did not Pass the Course: 45 (11%) / 64 (15%) Summary • 210 (50%) passed the course and passed the SLO	**Action:** The results of the SLO will be distributed to all current instructors of Math 23 and Spring 16 instructors of math 23. Recommendations and instructional resources will be given to instructors to help them: (1) incorporate more language into the math curriculum, (2) incorporate activities that test the

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Input Date: 11/20/2013	8x=-5 x=(-5) /8 When Paul went to check her answer, it did not work. Explain all the mistakes Paul made. Simply solving the problem correctly will not earn any credit. **Standard and Target for Success:** The method of grading will be a 5 point rubric. Passing is considered a score of a 4 or 5. **Exam/Test/Quiz -** Grading Rubric: The method of grading will be a 5 point rubric. Passing is considered a score of a 4 or 5. 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 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. 3 points - The solution demonstrates some conceptual understanding of the skill or concept involved, but has	• 96 (23%) passed the course and failed the SLO • 45 (11%) failed the course and passed the SLO • 64 (15%) failed the course and failed the SLO 73% of all students passed the course 61% passed the SLO (09/19/2016) **Faculty Assessment Leader:** Art Martinez **Faculty Contributing to Assessment:** Art Martinez, B Alex, B Dovner, T Roque, T Malouf, C Wei-Feng, D Eldanaof, G Valle, T Gizaw, T Mokoman, M Formanes, M Granich, M Cortez	students understanding of linear equations in a variety of ways other than the the tradition solution of an unknown variable. (09/19/2016) **Action Category:** Curriculum Changes **Follow-Up:** Recommendations and instructional resources will be given to instructors to help them: (1) incorporate more language into the math curriculum, (2) incorporate activities that test the students understanding of linear equations in a variety of ways other than the the tradition solution of an unknown variable. (09/19/2017)

Course SLOs	Assessment Method Description	Results	Actions
	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 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 1 point - The solution demonstrates a very weak understanding of the skill of concept involved. 0 points - No solution presented **Standard and Target for Success:** Passing is considered a score of a 4 or 5.		

ECC: MATH 37:Basic Accelerated Mathematics

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Application Problems - A student will be able to recognize the underlying mathematical concepts, with an emphasis on linear relations, in a given context (word problems, data, diagrams, etc.) and apply those concepts correctly. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 02/26/2015	**Exam/Test/Quiz -** The focus of this assessment were computer-based application problems on the numeracy level (Level A) of the Math 37 curriculum. Students successfully completing these five questions demonstrated proficiency in one- or two-step problems involving operations on integers. **Standard and Target for Success:** It is expected that 80% of students will score a 60% (3/5) or better on this very short assessment. No partial credit is possible on any of these questions, so if they solved a majority of problems correctly, we consider it a success.		
SLO #2 Solving Equations and Manipulating Expressions - A student will be able to demonstrate the ability to identify and correctly implement techniques to symbolically solve equations, with an emphasis on linear equations, and manipulate expressions. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 02/26/2015	**Exam/Test/Quiz -** Math 37 includes an online component where students are required to complete quizzes via the My Math Lab Pearson Publishing software. The Spring 2014 SLO was assigned as an online exam with 9 linear equation problems using integer and rational coefficients. The 9 problems are given below: Solve for x: 1. - 9 = x + 7 2. -8x - 4x = -7 3. x + 5y = 20 4. 7x = 33 + 4x 5. 6 - 4x = -8x + 18 6. 5x – 7 – 3x = 3x - 2 7. 5(5x – 3) + 10 = -3		

Course SLOs	Assessment Method Description	Results	Actions
	8.-3(x + 2) + 4 = 5(x + 3) + 6 9. (x - 7)/3 = 1 - x/7 **Standard and Target for Success:** Where the typical SLO is a single problem, we chose to assess 9 problems, where one included fractional coefficients and another problem included multiple variables. Considering the degree of difficulty of this SLO we felt a passing grade should be getting 6 of these 9 problems correct. Our target for success was for 2/3 of our students to pass this SLO.		
SLO #3 Visual and Graphical Methods - A student will be able to use visual and graphical methods to represent and analyze information and to solve problems, with an emphasis on linear graphs. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2016-17 (Spring 2017) **Input Date:** 02/26/2015	**Exam/Test/Quiz -** 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 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		

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	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. **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.		
SLO #4 Articulating Mathematical Reasoning - A student will be able to articulate orally or in written form the mathematical reasoning they used to solve a problem or analyze a situation. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 02/26/2015	**Exam/Test/Quiz -** In a two question quiz, in which students compare the work of two fictional students, we hope to learn how well students can analyze and articulate the mistakes made by the two students and explain the relationship between the reverse evaluation machine and solving a related equation.. We are attaching the question and the rubric used for grading this question. **Standard and Target for Success:** On both questions, our target for success is that at least 70% of the students will score a 2 or a 3 on the rubric. **Related Documents:** Math 37 SLO Spring 2016 Lars Version.docx Suggested Grading Rubric for Math 37 SLO.docx	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Not Met 171 students from eight Math 37 sections completed the SLO sometime during weeks 12 through 16 of the semester. The sample size is smaller than desired, but the results are still telling. On Question 1, which asked students to identify and describe errors in the two students' work, 121 students (71%) were able to identify all or some of the mistakes and 50 (29%) students were not able to identify mistakes. We barely met the standard. In the second question, in which students were asked to describe the relationship between reverse evaluations machines and the work the fictional students did solving a related equation, 94 students (55%) scored a 2 or 3 on the rubric and 77 students (45%) scored a 1. We did not meet our standard for the second question. Math 37 has a large online component and, until this SLO assessment cycle, we had been trying to create useful online assessments for our outcomes. However, we found that these have not worked to well. So this was our first attempt at a handwritten assessment. We felt that it was ambitious and we worried that we were not getting the	**Action:** Complete our semi-permanent, easily modifiable SLO general assessment, which can be used for all four SLOs, viewed through different rubric lenses. (05/31/2017) **Action Category:** SLO/PLO Assessment Process

Course SLOs	Assessment Method Description	Results	Actions
		structure of the assessment quite right, even as we were designing it. We were right. Introducing the two characters, instead being a vehicle to help students organize their responses, become a considerable distraction. Other issues are taken from the instructors' discussion of the results. These are representative. *The question should have been more general for #2, and not stated for Amy and Tammy, rather than comparing. It was hard to understand what they should have said for each person. It should rather just say “describe how you get a reverse machine if you had a correct evaluation machine” and leave the two student’s names out of it. For #1, the problem was that Tammy’s evaluation machine was not technically wrong, just unfinished, if she had done Step 4: Add RS1 and RS3, but then her reverse machine would have not worked out. But it was hard for students to describe WHY it was wrong because the equation was doing correct steps. Our advice is to change the wrong evaluation machine to have a glaring mistake, like Step 1: Subtract 8 from input Step 2: Add 8 to RS1 Step 3: Multiply RS2 by 5 This would’ve shown that the order of operations wasn’t correct, and when the reverse machine was done it wouldn’t get the correct answer. *What we noticed is that students were confused because Tammy’s equation was not only solved correctly, but in the “normal” way they have seen in their math classes. Some noticed it didn’t follow the reverse machine, but that was rare. *Some students felt that Tammy solved the equation correctly because followed PEDMAS to simplify the left hand side of the equation.	

Course SLOs	Assessment Method Description	Results	Actions
		*A common mistake students made in question 2 was that they did not know how to explain the relationship between Amy's Reverse Machine and how she solved the equation. *A lot of my students felt that the way Tammy solved the equation was was more correct than the way Amy solved the equation. I believe this happened because on the online homework they show them to solve linear equations the way Tammy did it. *Some of my students verbally told me while they were working on the SLO that the only reason Amy's evaluation machine was correct and Tammy's evaluation machine was incorrect was because we told the the students in lecture that they should not distribute when working on an evaluation machine. In summary, the assessment taught us more about how not to design this sort of assessment than it did about student learning. But it also brought to the surface questions about our purpose in using evaluation machines to enhance our students' capacity to articulate concepts in mathematics. (09/20/2016) **Faculty Assessment Leader:** Lars Kjeseth **Faculty Contributing to Assessment:** Lars Kjeseth, Ambika Silva, Susanne Bucher, Art Martinez, Juan Ortiz, Natalie Koch, Elizabeth Schwartz, Chris Dean, **Related Documents:** Math 37 SLO assessment SP2016 Results.xlsx	

ECC: MATH 40:Elementary Algebra

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Application Problems - Students will be able to recognize linear and quadratic equations in a given context, and use mathematical reasoning and problem solving skills to solve authentic, real world application problems. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** Students were asked to set up two linear equations based on an application problem. Then they were required to respond to a question regarding the two linear equations. Question: The Alpha Company offers a pay as you go cell phone plan for $10 per month plus 6 cents per minute. The Beta Company offers a pay as you go cell phone plan for $15 per month plus 2 cents per minute. a. Write an equation to represent the cost of the plan using the Alpha Company? Let x be the number of minutes that you talked. Cost = _____ b. Write an equation to represent the cost of the plan using the Beta Company? Let x be the number of minutes that you talked. Cost = _____ c. When will the two costs be the same? **Standard and Target for Success:** It is expected that 60% of the students will score a 2 or a 3 on this assessment. The grading rubric is below. Score of 0: Student cannot answer		

Course SLOs	Assessment Method Description	Results	Actions
	any of the three questions correctly. Score of 1: Student can correctly answer one of the three questions. Score of 2: Student can correctly answer two of the three questions. Score of 3: Student can correctly answer all of the questions. **Related Documents:** Math 40 SLO #1 Question Spring 2015		
SLO #2 Solving Equations and Manipulating Expressions - Students will be able to use numerical and symbolic representations of mathematical ideas to simplify or solve linear, quadratic, rational, and radical expressions or equations. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** Solving Quadratic Equations by Factoring Please use a problem such as: Solve for x: 3x^2 + 4x = 4 **Standard and Target for Success:** Grading: Please look for the following 3 key concepts when scoring 1. Sets equation equal to 0 before factoring 2. Factors correctly 3. Solves for x by setting each factor equal to 0 Students receive 1 point for completing each of the above. Please focus on overall understanding of the concepts. 0 – blank or no relevant information 1 – completes One of the key concepts correctly 2 – completes Two of the key concepts correctly 3 – completes all Three of the key concepts correctly It is expected that 60% of Math 40 students will score 2 or 3 on this SLO.		

Course SLOs	Assessment Method Description	Results	Actions
	Related Documents: SLO Instructions & Rubric		
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. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2016-17 (Spring 2017) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** 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. **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		
SLO #4 Articulating Mathematical Reasoning - Students will be able to articulate the mathematical reasoning used in a variety of problems, orally or in writing. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** Original Problem: Expand the expression: (2x + 3^2 The student's incorrect answer was: 4x^2 + 9 a. Explain in complete sentences the mistake the student made. b. Expand the expression correctly. Students were assessed according to the following rubric Score of 1: Student gives a vague explanation about the student mistake and did not expand the expression correctly. OR Student	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met Four hundred and fifty four students in 17 out of 20 sections were assessed on this SLO. The results are as follows 88 or 19.4% scored a 1 130 or 28.6% scored a 2 236 or 52% scored a 3 80.6% of the students scored a 2 or a 3 so the standard was met. Students who scored a 2 on the assessment could of scored a 3 if their explanation of the mistake was clearer, most students just stated that they would use foil to expand the problem but they didn't explain what the mistake in the	**Action:** More resources can only help students: more quality tutors, more SI's coaches, more computers in the labs, and paid office hours for part-time faculty. (09/09/2017) **Action Category:** Program/College Support

Course SLOs	Assessment Method Description	Results	Actions
	expanded the expression correctly and gave no explanation about mistake. Score of 2: Student gives an incomplete explanation of the mistake and expands the expression correctly. Score of 3: Student gives a complete explanation of the mistake and expands the expression correctly. **Standard and Target for Success:** It is expected that 70% of the students will score a 2 or a 3 on the assessment	students work was. Many students need more work on explaining their reasoning in mathematics, being able to talk about the mathematics will help with students retention of the information. (09/09/2016) **Faculty Assessment Leader:** Susanne Bucher & Catherine Schult Roman **Faculty Contributing to Assessment:** b. Mitchell, E. Morales, A. Stillson, J. Gill, A. Bojkov, J. Ng, J. Forbes, C. Schult-Roman, A. Shihabi, R. Wong, L. Saakian, D. Dammena, A. Gizaw, H. Nguyen	

ECC: MATH 60:Elementary Geometry

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Application Problems - Students will be able to define geometric terms, polygons, and shapes and apply characteristics of the shapes to solve geometric problems. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** Sketch & Label Quadrilateral Sketch, label and mark the following figure: trapezoid PQRS with PQ perpendicular to QR and PQ parallel to RS. Also angle S = 75 degrees. Use the information given to find the measures of angle R and angle P. **Standard and Target for Success:** Rubric for SLO #1 Assessment: Objective: Sketch and label a geometric figure and use the characteristics of that figure to find specific values associated with the figure. EXCELLENT: (3) • Figure drawn correctly with appropriate markings. • 75° angle drawn accurately • Correct values for angle R and angle P • Techniques used to solve problem clearly indicate student has an excellent understanding of concept. SATISFACTORY: (2) • Figure drawn with less than 2 errors. • 75° angle drawn within 5		

Course SLOs	Assessment Method Description	Results	Actions
	degrees of error • Correct values for angle R and angle P • Techniques used to solve problem indicate student has a satisfactory understanding of concept. NEEDS IMPROVEMENT: (1) • Figure drawn with 2 or more errors. • 75° angle is incorrect • Incorrect values of angle R and/or angle P • Techniques used to solve problem clearly indicate student has deficiencies in understanding the concept. UNSATISFACTORY: (0) • Figure is non-existent or extremely wrong. • No evidence of the student's ability to use a protractor correctly • Techniques used to solve problem clearly indicate student does not understand the concept. TARGET: At least 75% of students will score a 2 or 3 on the given problem.		
SLO #2 Solving Equations and Manipulating Expressions - Students will be able to calculate perimeter, area, surface area and volume for various 2D and 3D geometric shapes. **Course SLO Status:** Active	**Exam/Test/Quiz -** Surface Area/Volume You have a plan to construct a water tank. The tank will be a cylinder that is 30 feet long and 8 feet in diameter. How much sheet metal		

Course SLOs	Assessment Method Description	Results	Actions
Course SLO Assessment Cycle: 2013-14 (Spring 2014) **Input Date:** 11/20/2013	will you need to construct the water tank? a. Will you need to find surface area or volume to answer this question? Choose one. b. Draw a picture (not to scale) that includes correct placement of the measures given in this problem. c. Solve the problem. **Standard and Target for Success:** Rubric for SLO #2 Assessment: Objective: Demonstrate ability to identify & correctly implement techniques to symbolically solve & manipulate expressions. EXCELLENT: (3) • Correct choice of formula for solving problem • Clear evidence of the student's reasoning process • Correct picture with placement of measures • Techniques used to solve problem clearly indicate student has an excellent understanding of concept. SATISFACTORY: (2) • Correct choice of formula for solving problem • Some evidence of the student's reasoning process		

Course SLOs	Assessment Method Description	Results	Actions
	• Picture may contain an error in placement of measures • Techniques used to solve problem indicate student has a satisfactory understanding of concept. NEEDS IMPROVEMENT: (1) • Wrong choice of formula for solving problem • Little evidence of the student's reasoning process • Picture may have major errors in placement of measures or picture is incorrect 3D object • Techniques used to solve problem clearly indicate student has deficiencies in understanding the concept. UNSATISFACTORY: (0) • Student did not choose either formula. • No evidence of the student's reasoning process • No picture is drawn. • Techniques used to solve problem clearly indicate student does not understand the concept. TARGET: At least 75% of students in the class will obtain a score 3 or 4 on the given problem.		
SLO #3 Visual and Graphical Methods - Students will be able to construct geometric shapes using the compass and straightedge. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2016-	**Exam/Test/Quiz -** 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.		

Course SLOs	Assessment Method Description	Results	Actions
17 (Spring 2017) **Input Date:** 11/20/2013	**Standard and Target for Success:** It is expected that 75% of all students will receive an Excellent or Satisfactory on the SLO.		
SLO #4 Articulating Mathematical Reasoning - Students will be able to prove geometric conjectures and theorems using deductive logic. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** Prove that one diagonal of a rectangle of a rectangle divides a rectangle into two congruent triangles. **Standard and Target for Success:** OBJECTIVE: Prove geometric conjectures and theorems using deductive logic. SCORING RUBRIC EXCELLENT (3) • All steps in the proof are complete • Clear evidence of the student's reasoning process • Techniques used to complete the proof clearly indicate student has an excellent understanding of concept. SATISFACTORY (2) • Minor errors in the steps of the proof • Some evidence of the student's reasoning process • Techniques used to solve problem indicate student has a satisfactory understanding of concept. NEEDS IMPROVEMENT (1) • Lacking some or all of the criteria necessary for a satisfactory rating TARGET: At least 75% of students will score a	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Not Met During the Spring 2016 semester, four sections were assessed. A total of 93 students were assessed and 68.8% of them received a score of 2 or 3. The target has not been met and there is room for improvement. Proving geometric conjectures is an extremely difficult topic for students and for teachers to teach. (09/14/2016) **Faculty Assessment Leader:** Susie Tummers **Faculty Contributing to Assessment:** Susie Tummers, Beyene Bayssa, May Xu	**Action:** An email discussion shall take place among geometry teachers in an attempt to brainstorm ideas about ways to assist students in writing proofs. Lead teacher, Susie Tummers, will share her practice proofs with any teacher that may be interested in using them within class. (09/14/2020) **Action Category:** Teaching Strategies

Course SLOs	Assessment Method Description	Results	Actions
	2 or 3 on the given problem.		

ECC: MATH 67:General Education Algebra

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Application Problems - Students will be able to recognize and apply appropriate mathematical concepts and models involving a variety of functions to contextualized problems involving authentic, real-world data. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** Each section instructor administered the quiz to her/his section(s) and then assessed the understanding using a three point rubric. .The results are below. Passing the course indicates that a student received the grade of A, B, or C and could move on to a tranfer level course. **Standard and Target for Success:** The target for success is that 70% of the students will get 3 on the rubic for the SLO quiz. The rubic for the quiz was on a 3 point scale. 3 points = good understanding, 2 points= some understanding, but not complete, 1= Little to no understanding. A student passed the SLO if a 3 was assigned to the quiz and did not pass the SLO if a 2 or 1 was assigned to the quiz.		
	Exam/Test/Quiz - Each section instructor administered the quiz to her/his section(s) and then assessed the understanding using a three point rubric. The results are below. Passing the course indicates that a student received the grade of A, B, or C and could move on to a tranfer level course. **Standard and Target for Success:**		

Course SLOs	Assessment Method Description	Results	Actions
	The quiz was assessed with a three point rubric. 3 points = good understanding, 2 points= adequate understanding, but not complete, 1= Little to no understanding. A student passed the SLO if a 3 or 2 was assigned to the quiz and did not pass the SLO if a 1 was assigned to the quiz.		
SLO #2 Solving Equations and Manipulating Expressions - Students will be able to symbolically (algebraically) solve a variety of equations, inequalities and linear systems and manipulate symbolic (algebraic) expressions that arise in contextualized problems using authentic, real-world data. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** The SLO assessment is a quiz including several problems. Problem 4 was used to assess SLO #2. See attached. **Standard and Target for Success:** 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. **Related Documents:** Quiz11_SLO_SP14.pdf		
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. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2016-17 (Spring 2017) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** 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. **Standard and Target for Success:** 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. **Related Documents:** Math 67 SLO Quiz		

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #4 Articulating Mathematical Reasoning - Students will be able to articulate the mathematical reasoning used in solving a variety of contextualized problems using authentic, real-world data, orally or in writing. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** Each section used a separate SLO quiz. (see attached) **Standard and Target for Success:** The target for success is 70% passing with a score of 2 (satisfactory) or 3 (excellent).	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met Of the 80 students who were assessed, 56 students passed the SLO and passed the course, 2 students passed the SLO, but not the course; 16 students did not pass the SLO, but passed the course; and 6 students passed neither. This makes 70% passed the SLO and the course. These are preliminary results, but they look promising. A large majority of students are able to identify a table of values as being linear, exponential or neither, and able to write formulas for linear and exponential functions. More data and analysis is coming. (09/16/2016) **Faculty Assessment Leader:** Susan Taylor **Faculty Contributing to Assessment:** Beth Schwartz, Lars Kjeseth **Related Documents:** SLO Quiz09.pdf	**Action:** We will ask for more support for faculty teaching this nontraditional course. Faculty who teach the course for the first or second time should be compensated for attending weekly faculty cohort meetings and/or shadowing prior to the semester of teaching. We will also ask for earlier scheduling of teachers to the course to allow for better preparation and support. (09/23/2016) **Action Category:** Program/College Support

ECC: MATH 73:Intermediate Algebra for General Education

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Application Problems - Students will be able to recognize and apply appropriate mathematical concepts and models involving a variety of functions to contextualized problems (authentic, real-world applications). **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** Question: Casey wants to join a gym. She looks online and sees the following ads. LA Fitness has a $99 initiation fee with a $29.95. Gold's Gym is $19.99. Note: Gold's Gym didn't say on the ad that it has $199 initiation fee. Let f(x) be the function that represents the total cost for LA Fitness, where x is the number of months. a.) Let g(x) be the function that represents the total cost for Gold's Gym, where x is the number of months. Be sure to Note: Gold's Gym didn't say on the ad that it has $199 initiation fee. Find the equations for f(x) and g(x). b.) Casey decides to join Gold's Gym. Her fitness plans fall apart, and she quits the gym after just two months. Was Gold's Gym the better choice, or in hindsight should she have chosen LA Fitness and why? c.) After how many months will the two memberships have the same total cost? Explain your reasoning using a table, graph, or algebraic methods. Use the following rubric: 0 –No understanding Leaves question blank or there is no correct work 1 –Some understanding Does part a) correctly, but not b) or c)		

Course SLOs	Assessment Method Description	Results	Actions
	2 –Most understanding Does two parts correctly, understands b) and c) even if a) is incorrect. 3- Complete understanding All parts are correct **Standard and Target for Success:** It is expected that 70% of the students will score a 2 or higher on this SLO question.		
SLO #2 Solving Equations and Manipulating Expressions - Students will be able to symbolically (algebraically) solve a variety of equations, inequalities and linear systems and manipulate symbolic (algebraic) expressions that arise in contextualized problems. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** Math 73 SLO Assessment Spring 2014 SLO #2 Solving Equations and Manipulating Expressions Students will be able to symbolically (algebraically) solve a variety of equations, inequalities and linear systems and manipulate symbolic (algebraic) expressions that arise in contextualized problems. Part of SLO Sustainability is identifying areas that the students struggle with and discussing how we address them. We were asked that for this spring we focus on a SLO that is a problem area for students. Please give your students this problem or a problem similar to the following question Solve the following problem: 1/(x^2-7x+10)+1/(x-2)=2/(x^2-7x+10) This can be on an exam, quiz or final. I would suggest trying to do it for the appropriate test. This is chapter 8.5 in Lehmann and Chapter 6.7 in		

Course SLOs	Assessment Method Description	Results	Actions
	Tussy. I find it's nice to put it as the first question on a test, so I can go back and easily look at the front pages and fill out the tally form. Use the following rubric: 0 –No understanding Leaves question blank or there is no correct work 1 –Some understanding Tries to factor the denominator, knows needs to multiply by the LCD correctly 2 –Most understanding Correctly clears the fraction 3- Complete understanding Gets the correct answer (x = 6) **Standard and Target for Success:** It is expected that 65% of students will score a 2 or 3 (Satisfactory or Excellent) on this SLO. **Related Documents:** Math 73 SLO SPRING 2014 SLO#2.docx		
SLO #3 Visual and Graphical Methods - Students will use visual and graphical methods to represent, analyze and solve contextualized problems. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2016-17 (Spring 2017) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** 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		

Course SLOs	Assessment Method Description	Results	Actions
	$14,000? **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 SLO Data M73 SP2014.xlsx		
SLO #4 Articulating Mathematical Reasoning - Students will be able to articulate the mathematical reasoning used in solving a variety of contextualized problems, both orally and in writing. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** Questions offered: 1. Due to the poor economy, a real estate investor lost 120 thousand dollars in 2008. Let the ordered pair (2008,-120) represent this relationship. The investor did better in 2010 by earning 350 thousand dollars. Let the ordered pair (2010,350) represent this relationship. Calculate the average rate of change for the investor's earnings from 2008 to 2010. A student uses the slope formula to calculate the rate of change between (2008,-120) and (2010,350) . The student's work is shown below: m = (350-120)/(2008-2010) = 230/-2 = -115 thousand dollars per year (a) Using words, explain the two mathematical errors in the student's reasoning. (b) Calculate the correct rate of change between (2008,-120) and	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met We had a total of 513 students take the SLO assessment this semester. 51 scored 1 point. This is 10% of the sample. 142 scored 2 points. This is 28% of the sample. 320 scored 3 points. This is 62% of the sample. Overall, 462 out of 513, or approximately 90%, of the sampled students scored 2 or 3 points so we met and exceeded our target for success. Students were able to recognize mathematical errors and demonstrate correct calculations. Difficulties for students: 1. Missing an incorrect minus sign in the slope formula 2. Stating that the formula was used incorrectly without being too specific 3. Using a full, well-developed sentence 4. Clearly stating the errors A suggestion for improvement is to include more error analysis questions in homework and classwork sot hat students a re more familiar with these types of questions. (9/18/2017) (09/19/2016) **Faculty Assessment Leader:** Dominic Fanelli; Ambika SIlva **Faculty Contributing to Assessment:** Dominic Fanelli, Ambika Silva, Judy Kasabian, Michael Bateman, Matthew	**Action:** Present error analysis question in classwork and homework. Present class activities where students would concisely state mathematical reasoning using full sentences. Resources that can help: Students can benefit across sections with well-advertised study sessions with experienced tutors and SI coaches made available to all sections. Review sessions with tutors/SI every few weeks in anticipation of exams can improve confidence and performance results. (09/19/2016) **Action Category:** Teaching Strategies

Course SLOs	Assessment Method Description	Results	Actions
	(2010,350) 2. A student uses the distance formula to calculate the distance between the points (9,3) and (5,-2) . The student's work is shown below: d = sqrt[(9-5)^2 + (3-2)^2] = sqrt[4^2+1^2] = 4+1 =5 (a) Using words, explain the two mathematical errors in the student's reasoning. (b) Calculate the correct distance between the points (9,3) and (5,-2) . Rubric: Score of 0: Student cannot answer any of the questions correctly. Score of 1: Student can explain one mistake OR perform the calculation correctly. Score of 2: Student can explain both mistakes OR can explain one mistake and calculation correctly. Score of 3: Student explains both mistakes and does calculation correctly. **Standard and Target for Success:** Our target for success was 70% of students scoring 2 or 3 on this S.LO	Mata, Steve Martinez, Manolita Formanes, Malinni Roeun, Jasmine Ng, Marilyn Cortez, Kaysa Moreno, Lijun Wang, Hamza Hamza, C. Broderick, K Numrich	

ECC: MATH 80:Intermediate Algebra for Science, Technology, Engineering, and Mathematics

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Application Problems - Students will be able to solve application problems involving linear, quadratic, polynomial, rational, radical, exponential and logarithmic functions. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** Students were asked to us a quadratic function to solve a real world scenario involving revenue as a function of demand. Students were told that at $25 per unit, a toy has annual sales of 5,500 units. Students were informed that the manufactures of the toy are considering raising the price of the toy by 'x' dollars per unit. Using the results of a market survey, the manufacturer estimates that each $1 increase in price will result in a decrease in the number of sales of the toy by 125 units per year. Students were informed that revenue is equal to price times units sold and for each of the following sub-questions students were instructed to show their work to justify their solutions. For part A) they were asked to find an equation R(x) that models the revenue as a function of 'x' (the solution is quadratic function). For part B) students were asked to determine the expected revenue if the manufacturer raises the price to $32.50. Finally, for part C) students were asked to find the unit price that maximizes the total revenue. The question given follows: When priced at $25 each, a toy has annual sales of 5,500 units. The manufacturer is considering raising the price of the toy by 'x' dollars. Using the results of a market survey,		

Course SLOs	Assessment Method Description	Results	Actions
	the manufacturer estimates that each $1 increase in price will decrease sales by 125 units. A) Find an equation R(x) that models the revenue as a function of 'x'. (Show your work) hint: Revenue = (price)*(units sold) B) If the manufactur **Standard and Target for Success:** The target for this Assessment is to have more than 60% of our students reach either "much understanding' or "complete understanding"; that is, for more that 60% of our students to earn a score of '2' or '3'		
SLO #2 Solving Equations and Manipulating Expressions - Students will be able to evaluate numerical operations and manipulate algebraic expressions involving rational and negative exponents, radicals, complex numbers, exponents and logarithms and be able to solve linear, quadratic, polynomial, rational, radical, absolute value, exponential and logarithmic equations and inequalities. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** There were two questions selected this semester; Instructors had the freedom to select either one. The first question involved the exponential growth of Chipotle restaurants. Students were told that there were 75 Chipotle restaurants in 1993, 675 in 1995, and that the number of Chipotle restaurants grow exponentially. Students were given the general exponential growth function and for part a) of the question they were asked to find an exponential function on 't' number of years since 1990. For part b) students were asked to evaluate f(4) using their results from part a) and to interpret their results in a sentence format. Finally for part c) of the question students were asked to use their results from part a) to predict when the number of Chipotle restaurants will reach 10,000. The question given		

Course SLOs	Assessment Method Description	Results	Actions
	follows: The number of Chipotle restaurants has grown exponentially. In 1993 there were 75 Chipotle restaurants and in 1995 there were 675. Let f(t)=a·b^t be the number of Chipotle restaurants at 't' years since 1990. a) Find an equation of f(t). b) Evaluate f(4). What does it mean in this situation? c) Predict in which year Chipotle reached 10,000 restaurants. The second question involved the exponential growth of rodents in Los Angeles. Students were first given the general equation to model population growth. Then students were told that in 2014 the rodent population in Los Angeles was estimated to be 50,000; with an expectation that it will double every 4 years. For part a) of the question students were asked to find the value of the constant 'K' in the population growth formula. Then for part b) students were asked to use their results from part a) to predict when the rodent population was expected to reach 10 million. And finally, for part c) of the question students were asked to use their results from part a) to predict the rodent population in the year 2024. The question given follows: If 'P' is the population at some time 't', Po is the initial population at t = 0, and k depends on the rate of		

Course SLOs	Assessment Method Description	Results	Actions
	growth then, P = P0 ekt The rodent population in Los Angeles is currently (2014) estimated at 50,000. If it is expected to double every 4 years; a) Find the value of 'k' in the equation P = P0 ekt b) In what year will the rodent population in Los Angeles reach 10 million? c) what will be the rodent population in the year 2024? Both questions involved exponential equations. Both questions contained three very similar subparts. Therefore, the rubric for both questions was the same. 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. If students correctly answered all 3 subparts they would earn a score of '3', If students correctly answered 2 out of 3 subparts they would earn a score of 2, If students correctly answered 1 out of 3 subparts they would earn a score of 1, If students failed to answer any of the subparts correctly they would earn a score of 0, Use the following rubric: 0 –No understanding = Student answered none of the parts a)-c) correctly 1 –Some understanding = Student answered 1 of the parts a)-c) correctly		

Course SLOs	Assessment Method Description	Results	Actions
	2 –Much understanding = Student answered 2 of the parts a)-c) correctly 3- Complete understanding = Student answered all of the parts a)-c) correctly **Standard and Target for Success:** The target for this Assessment is to have more than 60% of our students reach either c "much understanding' or "complete understanding"; that is, for more that 60% of our students to earn a score of '2' or '3'		
SLO #3 Visual and Graphical Methods - Students will be able to use visual and graphical methods to represent, analyze and solve problem involving linear, quadratic, polynomial, rational, absolute value, radical, exponential, logarithmic functions, conic sections, linear and nonlinear systems of equations. Students will also be able to solve such functions and equations using graphical methods. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2016-17 (Spring 2017) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** Assessment Instrument: 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 accurate 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		

Course SLOs	Assessment Method Description	Results	Actions
	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). Rubric: 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. If students correctly answered all 3 subparts they would earn a score of ‘3’, If students correctly answered 2 out of 3 subparts they would earn a score of 2, If students correctly answered 1 out of 3 subparts they would earn a score of 1, If students failed to answer any of the subparts correctly they would earn a score of 0. Use the following rubric: 0 –No understanding = Student answered none of the parts a)-c) correctly 1 –Some understanding = Student answered one of the parts a)-c) correctly 2 –Much understanding = Student answered two of the parts a)-c) correctly 3- Complete understanding = Student answered all of the parts a)-c) correctly **Standard and Target for Success:**		

Course SLOs	Assessment Method Description	Results	Actions
	The target for this Assessment is to have more than 60% of our students reach either c "much understanding' or "complete understanding"; that is, for more that 60% of our students to earn a score of '2' or '3'		
SLO #4 Articulating Mathematical Reasoning - Students will be able to explain verbally, both orally or in writing, and the mathematical reasoning used in an application problem involving linear, quadratic, polynomial, rational, radical, absolute value, exponential and logarithmic equations and inequalities. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/20/2013	**Exam/Test/Quiz -** Suppose you want to model the resale value of a 2012 Nissan Versa based on its mileage. You know that with 10,000 miles it has a resale of value of $12,350 and with 80,000 miles it has a resale value of $7,800. (a) Build a linear model for the resale value, V, in terms of the number of miles x. (b) Interpret the slope of your model in the context of this situation. (c) Interpret the V-intercept of your model in the context of this situation. (d) At what mileage does your model predict that a 2012 Nissan Versa will no longer have any resale value? **Standard and Target for Success:** Students were assessed according to the following rubric. 0 –No understanding The student is unable to construct the linear model. 1 –Some understanding The student is able to construct the linear model but is unable to interpret the slope/intercept and is	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met We assessed 582 students during the Spring 2016 semester. 114 students scored a 0. This was 19.6% of our sample. 117 students scored a 1. This was 20.1% of our sample. 172 students scored a 2. This was 29.6% of our sample. 179 students scored a 3. This was 30.8% of our sample. Overall, 60.4% of our students scored a 2 or 3. This meant that we met our target for success of 60%. Most students were able to construct the linear model. Most mistakes occurred during the interpretation process. Instructors found class or group discussions very useful in helping with student understanding of interpretation. Class exercises that integrated the construction of linear equations with modeling situations also helped students. Instructors also noted that students often struggle with application questions and that some students found the larger numbers and units in this question challenging. (09/18/2016) **Faculty Assessment Leader:** Ben Mitchell **Faculty Contributing to Assessment:** B. Mitchell, P. Yun, E. Morales, B. Dovner, D. Fanelli, E. Barajas, L. Saakian, E. Ndoumna, A. Ovanessian, A. Seyedin, L. Ho, M. Bateman, G. Fry, A. Sheynshteyn, A. Gizaw, Z. Marks, C. Watson, B. Lewis, J. Cohen, J. Evensizer, L. Wang	**Action:** More resources can only help students: more quality tutors, more SI's coaches, more computers in the labs, and paid office hours for part-time faculty. These are especially important for questions based on interpretation that requires students to discuss and analyze with their classmates and instructors. (09/18/2017) (09/18/2016) **Action Category:** Program/College Support

Course SLOs	Assessment Method Description	Results	Actions
	unable to use the model in part (d). 2 –Most understanding The student is able to construct the linear model and either interpret the slope and intercept OR is able to use the model in part (d). 3- Complete understanding The student is able to construct the model, interpret both the slope/intercept, and uses the model correctly in part (d). ¬¬ Our target for success was for 60% of our students to score a 2 or 3 on this SLO.		