Assessment: Assessment Unit Four Column

Spring/Summer 2016

El Camino: PLOs (MATH) - Math (Prospective Elementary School Teachers)

PLOs	Assessment Method Description	Results	Actions

PLO #1 Solving Application Problems - Students will be able to determine an appropriate strategy to solve an application problem, complete the solution of the problem, describe the procedures used to solve the problem, and explain the underlying mathematical concepts using written and oral means.
PLO Status: Active
PLO Assessment Cycle: 2013-14 (Spring 2014), 2014-15 (Spring 2015), 2015-16 (Spring 2016), 2016-17 (Spring 2017), 2017-18 (Spring 2018)
Input Date: 07/01/2013
	Multiple Assessments - To assess this SLO, faculty teaching Math 110, Math 115, and Math 116 will use tests, quizzes, class activities, projects, homework, and writing assignments to determine the level of success students' have reached regarding this PLO.
	Standard and Rubric: The following rubric will be used to assess this PLO.
	
	Score of 4:
	Students demonstrate a keen understanding of setting up and solving application problems. Students are able to solve the application problems with no errors. Students are able to provide an exemplary explanation of the mathematical concepts for the application problems.
	
	Score of 3:
	Students demonstrate a good understanding of setting up and solving application problems. Students are able to solve the application with minor errors. Students are able to provide a good
		Semester of Current Assessment: 2017-18 (Spring 2018)
		Standard Met: Standard Met
		RESULTS
		Math 110, Math 115, Math 116
		    Mean = 3.01
		    Standard Deviation = 0.61
		Pearson Correlation Coefficient: -0.22
		Correlation Conclusion: There is no correlation between number of absences and PLO #1.
		Average Number of Absences: 3.22
		Sample Size: 79
		
		Math 110 Only
		    Mean = 3.02
		    Standard Deviation = 0.61
		Pearson Correlation Coefficient: -0.25
		Correlation Conclusion: There is no correlation between number of absences and PLO #1.
		Average Number of Absences: 3.04
		Sample Size: 52
		
		Math 115 and Math 116 Only
		    Mean = 3.00
		    Standard Deviation = 0.62
		Pearson Correlation Coefficient: -0.16
		Correlation Conclusion: There is no correlation between number of absences and PLO #1.
		Average Number of Absences: 3.56
		Sample Size: 27
			Action: Instructors in the Math for Teachers program will continue to emphasize the importance of class attendance. We will continue to model and explore different problem solving strategies in our classrooms and give students opportunities to work with their peers on implementing these strategies on a variety of application problems. (09/05/2019)
			Action Category: Teaching Strategies
			Follow-Up: The importance of attending each class session is emphasized by every instructor. Students continue to have the opportunity in class to work with their peers on different problem solving strategies. (09/13/2019)

PLOs	Assessment Method Description	Results	Actions

explanation of the mathematical concepts for the application problems.

Score of 2:
Students demonstrate a fair understanding of setting up and solving application problems. Students are able to solve the application problems with several errors.
Students are able to provide some information about the mathematical concepts for the application problems.

Score of 1:
Students are unable to demonstrate set up and solve application problems.
Students are not able to solve the application problems or they are able to solve the application problems with significant errors.
Students are not able to provide an explanation of the mathematical concepts for the application problems.

CORRELATION BETWEEN THE NUMBER OF ABSENCES AND THE SUM OF THE SCORES FOR THE 3 PLOS

To determine if there is a positive correlation, negative correlation, or no correlation, the Pearson Correlation Coefficient was used. The Pearson Correlation Coefficient represents the slope of the Best Fit

At least 70% of the students in Math 110, 115 and 116 have reached the benchmark of a score of 3 or higher. The mean and standard deviation for PLO #1 have remained consistent over the past few years, with a mean score above 3.00 each year. Students are able to successfully select an appropriate strategy to solve application problems, determine the reasonableness of their answers, and communicate their strategies and solutions in written and oral form. The mean score did decrease by 0.27 compared to the mean score for PLO #1 in 2016 and 2017. The average number of absences did increase to 3.22 as compared to the 1.82 average number of absences in 2017 and 2.57 in 2016. This increase in the average number of absences may have resulted in a lower mean score for this PLO. Although the Pearson Correlation Coefficient showed no statistical correlation between the number of absences and students score on PLO #1, we contend as instructors that students who miss class have less opportunities to discuss and explore mathematical concepts with their peers.
(09/05/2018)
Faculty Assessment Leader: Susanne Bucher
Faculty Contributing to Assessment: Susanne Bucher, Susie Tummers, James Yang
Courses Associated with PLO Assessment: Math 110, 115 and 116

Semester of Current Assessment: 2016-17 (Spring 2017)
Standard Met: Standard Met
RESULTS
Math 110, Math 115, Math 116
    Mean = 3.28
    Standard Deviation = 0.65
Pearson Correlation Coefficient: -.164
Correlation Conclusion: There is no correlation between number of absences and PLO #1.
Average Number of Absences: 1.82
Sample Size: 72

Math 110 Only

Action: We will continue to emphasize the important components of solving application problems, which are carefully selecting an appropriate strategy, predict the potential answer to the problem and check if their answers are reasonable in the context of the problem, and articulate the strategy that was used, the answer to the problem, and why the solution is

PLOs	Assessment Method Description	Results	Actions
	Line representing the data. The following scale is used to determine correlation. 　　　Pearson Correlation Coefficient = 1.0 [Perfect Positive Correlation] 　　　Pearson Correlation Coefficient between 0.7 and 1.0 [Acceptable Positive Correlation] 　　　Pearson Correlation Coefficient between 0.7 and -0.7 [No Correlation] Pearson Correlation Coefficient between -0.7 and -1.0 [Acceptable Negative Correlation] Pearson Correlation Coefficient = -1.0 [Perfect Negative Correlation] TARGET FOR SUCCESS The Math for Teachers Committee has determined that 70% of students attaining a rubric score of 3 as the target of success.	Mean = 3.36 　　　Standard Deviation = 0.62 Pearson Correlation Coefficient: .04 Correlation Conclusion: There is no correlation between number of absences and PLO #1. Average Number of Absences: 1.80 Sample Size: 52 Math 115 and Math 116 Only 　　　Mean = 3.05 　　　Standard Deviation = 0.64 Pearson Correlation Coefficient: -.42 Correlation Conclusion: There is no correlation between number of absences and PLO #1. Average Number of Absences: 1.87 Sample Size: 20 At least 70% of the students in Math 110, 115, and 116 have reached the benchmark of a score of 3 or higher. The mean and standard deviation for PLO #1 have remained consistent over time. Students are able to successfully select an appropriate strategy to solve application problems, determine the reasonableness of their answers, and communication their strategies and solutions in written and oral means. In addition, the average number of absences for students enrolled in Math 110, Math 115, and Math 116 has decreased as compared to the students in these courses during the Spring 2016 semester. We acknowledge that even though the data is limited, we continue to be encouraged with this trend and will examine this trend over time. (08/25/2017) **Faculty Assessment Leader:** Judy Kasabian **Faculty Contributing to Assessment:** Susie Tummers, Judy Kasabian, Susanne Bucher **Courses Associated with PLO Assessment:** Math 110, Math 115, Math 116	reasonable and makes sense in the context of the problem. We content that the more practice students have in this endeavor, the stronger their performance will be on this learning outcome. (08/25/2018) **Action Category:** Teaching Strategies **Follow-Up:** Instructors in the Math for Teachers program use activities and group work during class time to allow students the opportunity to explore, practice and discuss different problem solving strategies. (09/05/2018)
		Semester of Current Assessment: 2013-14 (Spring 2014) **Standard Met:** Standard Met DATA	**Action:** We plan to examine how attendance impacts student

PLOs	Assessment Method Description	Results	Actions
		The data for this PLO is reported below. Math 110, 115, and Math 116 (99 students) 26 (26%) scored a 4 59 (59%) scored a 3 13 (13%) scored a 2 1 (2%) scored a 1 86% of the students completing Math 110, 115, and 116 scored a 3 or 4. Standard was met. Math 110 Only (43 students) 9 (21%) scored a 4 31 (72%) scored a 3 3 (7%) scored a 2 0 (0%) scored a 1 93% of the students completing Math 110 scored a 3 or 4. Standard was met. Math 115 and 116 (56 students) 17 (30%) scored a 4 28 (50%) scored a 3 10 (18%) scored a 2 1 (2%) scored a 1 80% of the students completing Math 115 and 116 scored a 3 or 4. Standard was met. ANALYSIS The data indicates that students completing Math 110, Math 115, or Math 116 are able understand application problems by demonstrating their ability to select an appropriate strategy to set up and solve the problem. Since application problems are common in many mathematics courses, Math 110, Math 115, and Math 116 students have experience with these sorts of problems in varying degrees of success and are able to reach the anticipated standard of success. Even though students have reached the standard of success, we notice that if students do not regularly attend class, there are obvious gaps in their understanding of the mathematics topics being investigated, limited	performance on each of the three PLOs. We contend that if students are not in class, they not only miss mathematics content, but more importantly miss the opportunity to explore and investigate the underpinnings of a mathematical idea, discuss how think and reason mathematically, discover the connections within mathematics and between mathematics and other disciplines, and explain the concepts in their own words. We plan to examine the correlation between student attendance and their rubric score for each of the PLOs. We will collect this data at the end of the semester and report the findings on the next cycle of PLO assessment. (05/15/2015) **Action Category:** SLO/PLO Assessment Process **Follow-Up:** During the spring 2015 semester, we examined the correlation between the number of student absences and achievement on PLO #1. We combined the scores for PLO #1, PLO #2, and PLO #3 to produce a SUM of PLO Scores. We then looked at three groups and computed the Pearson Correlation Coefficient to determine if there is any correlation between the number of student absences and assessment of the PLOs. We compiled the data for three

PLOs	Assessment Method Description	Results	Actions
		experience probing mathematical ideas through inquiry activities, and little time to discuss mathematical ideas with their peers and instructor. (04/24/2014) **Faculty Assessment Leader:** Judy Kasabian **Faculty Contributing to Assessment:** Susanne Bucher, Judy Kasabian, Trudy Meyer, Susie Tummers **Courses Associated with PLO Assessment:** Math 110, Math 115, Math 116	groups and the data and implications are listed below. Math 110, Math 115, and Math 116: Pearson Correlation Coefficient = -.23 which indicates no correlation. Math 110 only: The Pearson Correlation Coefficient = -.30 which indicates that there is no correlation. Math 115 and Math 116 only: The Pearson Correlation Coefficient = -21 which indicates that there is no correlation. Even though the Spring 2015 semester did not reveal any correlation between absences and achievement on PLOs, we plan to continue to examine this idea in future semesters. (04/30/2015)
	Multiple Assessments - To determine the score (using the scoring rubric) for each student in Math 110, Math 115, and Math 115, instructors use tests, quizzes, projects, group work, group discussions, and activities. **Standard and Rubric:** RUBRIC FOR ASSESSMENT Score of 4: • Students demonstrate a keen understanding of setting up and solving application problems. • Students are able to solve the application problems with no errors.	**Semester of Current Assessment:** 2015-16 (Spring 2016) **Standard Met:** Standard Met RESULTS Math 110, Math 115, Math 116 　　Mean = 3.28 　　Standard Deviation = 0.71 Pearson Correlation Coefficient: -.26 Correlation Conclusion: There is no correlation between number of absences and SLO #1. Average Number of Absences: 2.57 Sample Size: 92 Math 110 Only 　　Mean = 3.27 　　Standard Deviation = 0.72 Pearson Correlation Coefficient: -.20	**Action:** We will continue to emphasize the important components of solving application problems, which are carefully selecting an appropriate strategy, predict the potential answer to the problem and check if their answers are reasonable in the context of the problem, and articulate the strategy that was used, the answer to the problem, and why the solution is reasonable and makes sense in the context of the problem. We content that the more practice

PLOs	Assessment Method Description	Results	Actions

	• Students are able to provide an exemplary explanation of the mathematical concepts for the application problems.
	Score of 3:
	• Students demonstrate a good understanding of setting up and solving application problems.
	• Students are able to solve the application with minor errors.
	• Students are able to provide a good explanation of the mathematical concepts for the application problems.
	Score of 2:
	• Students demonstrate a fair understanding of setting up and solving application problems.
	• Students are able to solve the application problems with several errors.
	• Students are able to provide some information about the mathematical concepts for the application problems.
	Score of 1:
	• Students are unable to demonstrate set up and solve application problems.
	• Students are not able to solve the application problems or they are able to solve the application problems with significant errors.
	• Students are not able to provide an explanation of the mathematical concepts for the application problems.
	
	The Standard for Success is 70% attainment.
		Correlation Conclusion: There is no correlation between number of absences and SLO #1.
		Average Number of Absences: 2.55
		Sample Size: 55
		
		Math 115 and Math 116 Only
		    Mean = 3.31
		    Standard Deviation = 0.70
		Pearson Correlation Coefficient: -.35
		Correlation Conclusion: There is no correlation between number of absences and SLO #1.
		Average Number of Absences: 2.51
		Sample Size: 37
		
		The mean and standard deviation for PLO #1 have remained consistent over time. Students are able to successfully select an appropriate strategy to solve application problems, determine the reasonableness of their answers, and communication their strategies and solutions in written and oral means. (05/04/2016)
		Faculty Assessment Leader: Judy Kasabian
		Faculty Contributing to Assessment: Judy Kasabian, Susie Tummers, Susanne Bucher
		Courses Associated with PLO Assessment: Math 110, Math 115, Math 116
			students have in this endeavor, the stronger their performance will be on this learning outcome. (05/04/2017)
			Action Category: Teaching Strategies
			
			Follow-Up: Data collected during the Spring 2017 semester for PLO #1 indicates that the target for success has once again been met. (08/25/2017)

		Semester of Current Assessment: 2014-15 (Spring 2015) **Standard Met:** Standard Met For PLO #1, the mean and standard deviation was computed for three groups of students. The data and implications is presented below. For Math 110, Math 115, Math 116: The mean = 3.27 and standard deviation = 0.74 For Math 110 only: The mean = 3.25 and standard deviation = 0.63 For Math 115 and Math 116 only: The mean = 3.31 and standard deviation = 0.58 During faculty discussions about this data, we concluded that the means for the spring 2015 students both as a	**Action:** We did not find any correlation between the number of student absences and performance on PLO #1 for students in taking the Math for Teachers courses during the spring 2015 semester. We plan to continue to look at this data to see how this trend plays out over time. (05/20/2016) **Action Category:** Teaching Strategies **Follow-Up:** The Math for Teachers instructors continue to collect

PLOs	Assessment Method Description	Results	Actions
		collective group and for the two subgroups was higher than previous semesters. This was great news. (04/30/2015) **Faculty Assessment Leader:** Judy Kasabian **Faculty Contributing to Assessment:** Susanne Bucher, Trudy Meyer, Susie Tummers **Courses Associated with PLO Assessment:** Math 110, Math 115, and Math 116	attendance data each semester to see if there is any correlation between attendance and student performance on SLO/PLO assessments. (09/29/2018) **Action:** We plan to continue to examine if there is any correlation between number of student absences and attainment of PLO #1 in future semesters. (05/20/2016) **Action Category:** Teaching Strategies **Follow-Up:** Data collected during the Spring 2016 semester for PLO #1 indicates that the target for success has once again been met. (05/04/2016)
PLO #2 Explaining Mathematical Concepts - Students will be able to demonstrate and explain mathematical concepts using a variety of methods. **PLO Status:** Active **PLO Assessment Cycle:** 2013-14 (Spring 2014), 2014-15 (Spring 2015), 2015-16 (Spring 2016), 2016-17 (Spring 2017), 2018-19 (Spring 2019) **Input Date:** 07/01/2013	**Multiple Assessments -** To assess this SLO, faculty teaching Math 110, Math 115, and Math 116 will use tests, quizzes, class activities, projects, homework, and writing assignments to determine the level of success students' have reached regarding this PLO. **Standard and Rubric:** The following rubric will be used to assess this PLO. Score of 4: Students demonstrate a keen understanding of a variety of mathematical concepts. Students are able to provide an exemplary explanation of a variety of mathematical concepts in written and oral means.	**Semester of Current Assessment:** 2018-19 (Spring 2019) **Standard Met:** Standard Met Results Math 110, Math 115 & Math 116 Mean: 2.88 Standard Deviation: 0.947 Seventy-nine students were assessed in all three courses and the breakdown is as follows 22 students or 28% scored a 4 35 students or 44% scored a 3 13 students or 17% scored a 2 9 students or 11% scored a 1 72% of the students completing Math 110, 115 and 116 scored a 3 or 4. Standard was met. Math 110 Only Mean: 2.8 Standard Deviation: 1.04 Fifty-five students were assessed and the breakdown is as	**Action:** Instructors will continue to emphasize the importance of explanations in class discussions, projects and assignments, and on a variety of assessments. Instructors will also continue to emphasize the importance of class attendance. Students need to be present in class in order to take advantage of the many in class opportunities for explanation of mathematical concepts. (09/13/2020) **Action Category:** Teaching Strategies

	Score of 3: Students demonstrate a good understanding of a variety of mathematical concepts. Students are able to provide a good explanation of a variety of mathematical concepts in written and oral means. Score of 2: Students demonstrate a fair understanding of a variety of mathematical concepts. Students are able to provide fair explanation about a variety of mathematical concepts in written and oral means. Score of 1: Students are unable to demonstrate any understanding of a variety of mathematical concepts. Students are not able to provide an explanation of a variety of mathematical concepts in written and oral means. **Additional Comments:** No additional comments.	follows 16 students or 29% scored a 4 21 students or 38% scored a 3 9 students or 16% scored a 2 9 students or 16% scored a 1 67% of the students completing Math 110 scored a 3 or 4. Standard was not met. Math 115 & Math 116 Only Mean: 3.08 Standard Deviation: 0.654 Twenty-four students were assessed and the breakdown is as follows 6 students or 25% scored a 4 14 students or 58% scored a 3 4 students or 17% scored a 2 0 students scored a 1 83% of the students completing Math 115 and 116 scored a 3 or 4. Standard was met. Analysis The data indicates that as a collective group (Math 110, 115, & 116) students are able to adequately explain mathematical concepts in both oral and written form. If we look only at the results for Math 110 we can see that these students have not yet met the standard of success. Typically courses prior to Math 110 do not focus on having student explain mathematically concepts in depth so often times students taking this entry level course in the math for teacher program will struggle with their explanations. Looking at the data for Math 115 & 116 only we can see that these students have a better handle on their explanations. The majority of students will complete Math 110 first and then take Math 115 and/or 116 which means they have already had some experience explaining mathematical concepts. Also the class size for both 115 and 116 was much smaller than the class sizes of 110 which allowed for more individual attention from the instructor. Due to the smaller class size the instructor for Math 116	

PLOs	Assessment Method Description	Results	Actions

used a new approach this semester which included speaking to each student individually, prior to assessments, about what concepts were still unclear to them. From this student feedback, review problems and conceptual understanding discussions were completed prior to the assessment. (09/13/2019)

Faculty Assessment Leader: Susanne Bucher
Faculty Contributing to Assessment: Susie Tummers, Jacob Love, Susanne Bucher
Courses Associated with PLO Assessment: Math 110, 115, 116

Semester of Current Assessment: 2013-14 (Spring 2014)
Standard Met: Standard Not Met
DATA
The data for this PLO is reported below.

Math 110, 115, and Math 116 (99 students)
        23 (23%) scored a 4
41 (41%) scored a 3
31 (31%) scored a 2
4 (5%) scored a 1

64% of the students completing Math 110, 115, and 116 scored a 3 or 4. Standard was not met.

Math 110 Only (43 students)
        7 (16%) scored a 4
19 (44%) scored a 3
17 (40%) scored a 2
0 (0%) scored a 1

60% of the students completing Math 110 scored a 3 or 4. Standard was not met.

Math 115 and 116 (56 students)
        16 (28%) scored a 4
22 (40%) scored a 3
14 (25%) scored a 2
4 (7%) scored a 1

Action: We plan to examine how attendance impacts student performance on each of the three PLOs. We contend that if students are not in class, they not only miss mathematics content, but more importantly miss the opportunity to explore and investigate the underpinnings of a mathematical idea, discuss how think and reason mathematically, discover the connections within mathematics and between mathematics and other disciplines, and explain the concepts in their own words. We plan to examine the correlation between student attendance and their rubric score for each of the PLOs. We will collect this data at the end of the semester and report the findings on the next cycle of PLO assessment. (05/15/2015)
Action Category: SLO/PLO Assessment Process

Follow-Up: During the spring 2015

PLOs	Assessment Method Description	Results	Actions
		68% of the students completing Math 115 and 116 scored a 3 or 4. Standard was not met. ANALYSIS The data indicates that both as a collective and individual groups, Math 110, Math 115, and Math 116 are not able to adequately explain mathematical concepts in written and oral form. Explaining mathematical concepts requires students to have a deeper understanding of mathematical ideas, make connections between mathematical ideas, compare and contrast mathematical attributes, and to delve in mathematics beyond just finding an answer. This task is complex and given the varied mathematical experiences and knowledge levels of students, this PLO will always be challenging. In addition, explaining mathematical concepts is not universally taught in all mathematics classes so their experience with explanations is much more limited than other tasks we ask students to do. In addition, we notice that if students do not regularly attend class, there are obvious gaps in their understanding of the mathematics topics being investigated, limited experience probing mathematical ideas through inquiry activities, and little time to discuss mathematical ideas with their peers and instructor. (04/24/2014) **Faculty Assessment Leader:** Judy Kasabian **Faculty Contributing to Assessment:** Susanne Bucher, Judy Kasabian, Trudy Meyer, Susie Tummers **Courses Associated with PLO Assessment:** Math 110, Math 115, Math 116	semester, we examined the correlation between the number of student absences and achievement on PLO #1. We combined the scores for PLO #1, PLO #2, and PLO #3 to produce a SUM of PLO Scores. We then looked at three groups and computed the Pearson Correlation Coefficient to determine if there is any correlation between the number of student absences and assessment of the PLOs. We compiled the data for three groups and the data and implications are listed below. Math 110, Math 115, and Math 116: Pearson Correlation Coefficient = -.23 which indicates no correlation. Math 110 only: The Pearson Correlation Coefficient = -.30 which indicates that there is no correlation. Math 115 and Math 116 only: The Pearson Correlation Coefficient = -21 which indicates that there is no correlation. Even though the Spring 2015 semester did not reveal any correlation between absences and achievement on PLOs, we plan to continue to examine this idea in future semesters. (04/30/2015)
	Multiple Assessments - To		

PLOs	Assessment Method Description	Results	Actions

	determine the score (using the scoring rubric) for each student in Math 110, Math 115, and Math116, instructors use tests, quizzes, projects, group work, group discussions, and activities.
	Standard and Rubric: RUBRIC FOR ASSESSMENT
	Score of 4:
	• Students demonstrate a keen understanding of a variety of mathematical concepts.
	• Students are able to provide an exemplary explanation of a variety of mathematical concepts in written and oral means.
	Score of 3:
	• Students demonstrate a good understanding of a variety of mathematical concepts.
	• Students are able to provide a good explanation of a variety of mathematical concepts in written and oral means.
	Score of 2:
	• Students demonstrate a fair understanding of a variety of mathematical concepts.
	• Students are able to provide fair explanation about a variety of mathematical concepts in written and oral means.
	Score of 1:
	• Students are unable to demonstrate any understanding of a variety of mathematical concepts.
	• Students are not able to provide an explanation of a variety of mathematical concepts in written and oral means.
		Semester of Current Assessment: 2016-17 (Spring 2017)
		Standard Met: Standard Met
		Math 110, Math 115, Math 116
		        Mean = 2.94
		        Standard Deviation = .51
		Pearson Correlation Coefficient: -.19
		Correlation Conclusion: There is no correlation between number of absences and PLO #2.
		Average Number of Absences: 1.82
		Sample Size: 72
		
		Math 110 Only
		        Mean = 2.94
		        Standard Deviation = .75
		Pearson Correlation Coefficient: -.51
		Correlation Conclusion: There is no correlation between number of absences and PLO #2.
		Average Number of Absences: 1.80
		Sample Size: 52
		
		Math 115 and Math 116 Only
		        Mean = 2.99
		        Standard Deviation = 0..66
		Pearson Correlation Coefficient: -.51
		Correlation Conclusion: There is no correlation between number of absences and PLO #2.
		Average Number of Absences: 1.87
		Sample Size: 20
		
		At least 70% of the students in Math 110, 115, and 116 have reached the benchmark of a score of 3 or higher. The mean and standard deviation for PLO #2 has returned to the typical performances of Math 115 and Math 116 students which is in contrast with the findings from Spring 2016. The mean and standard deviation results continue to exhibit that asking students to explain concepts in an articulate and complete fashion is still a difficult task for some students. We continue to contend that for future teachers, being able to explain concepts and procedures in a clear fashion is imperative for anyone who plans to become a classroom
			Action: We continue to contend that explaining mathematical procedures is significantly less difficult than explaining mathematical concepts. When a student can explain a mathematical concept, they show a deeper and more comprehensive understanding of the mathematics and are able to connect mathematical ideas in a logical way. We also contend that for future teachers, it is extremely important that they are competent in explanations of procedures and concepts since this is what will be required of them when they become classroom teachers. We will continue to emphasize the importance of explanations in class discussions, projects and assignments, and on a variety of assessments. In addition, the average number of absences for students enrolled in Math 110, Math 115, and Math 116 has decreased as compared to the students in these courses during the Spring 2016 semester. We acknowledge that even though the data is limited, we continue to be encouraged with this trend and will examine this trend over time. (08/25/2018)
			Action Category: Teaching Strategies
			
			Follow-Up: Instructors in the Math for Teachers program continue to emphasize the

PLOs	Assessment Method Description	Results	Actions

	CORRELATION BETWEEN THE NUMBER OF ABSENCES AND THE SUM OF THE SCORES FOR THE 3 PLOS
	
	To determine if there is a positive correlation, negative correlation, or no correlation, the Pearson Correlation Coefficient was used. The Pearson Correlation Coefficient represents the slope of the Best Fit Line representing the data. The following scale is used to determine correlation.
	        Pearson Correlation Coefficient = 1.0 [Perfect Positive Correlation]
	        Pearson Correlation Coefficient between 0.7 and 1.0 [Acceptable Positive Correlation]
	        Pearson Correlation Coefficient between 0.7 and -0.7 [No Correlation]
	Pearson Correlation Coefficient between -0.7 and -1.0 [Acceptable Negative Correlation]
	Pearson Correlation Coefficient = -1.0 [Perfect Negative Correlation]
		teacher.
		
		 (08/25/2017)
		Faculty Assessment Leader: Judy Kasabian
		Faculty Contributing to Assessment: Judy Kasabian, Susie Tummers, Susanne Bucher
		Courses Associated with PLO Assessment: Math 110, Math 115, Math 116
			importance of explanations in class discussions, projects, assignments and assessment.
			
			 (09/05/2018)

		Semester of Current Assessment: 2015-16 (Spring 2016)
		Standard Met: Standard Met
		RESULTS
		
		Math 110, Math 115, Math 116
		        Mean = 2.73
		        Standard Deviation = 1.24
		Pearson Correlation Coefficient: -.24
		Correlation Conclusion: There is no correlation between number of absences and SLO #2.
		Average Number of Absences: 2.57
		Sample Size: 92
		
		Math 110 Only
		        Mean = 2.39
		        Standard Deviation = 1.36
		Pearson Correlation Coefficient: -.11
		Correlation Conclusion: There is no correlation between number of absences and SLO #2.
		Average Number of Absences: 2.55
		Sample Size: 55
		
		Math 115 and Math 116 Only
		        Mean = 3.25
		        Standard Deviation = 0.79
		Pearson Correlation Coefficient: -.50
		Correlation Conclusion: There is no correlation between number of absences and SLO #2.
		Average Number of Absences: 2.51
		Sample Size: 37
		
		The mean for the data for PLO #2 are lower and standard
			Action: We continue to contend that explaining mathematical procedures is significantly less difficult than explaining mathematical concepts. When a student can explain a mathematical concept, they show a deeper and more comprehensive understanding of the mathematics and are able to connect mathematical ideas in a logical way. We also contend that for future teachers, it is extremely important that they are competent in explanations of procedures and concepts since this is what will be required of them when they become classroom teachers. We will continue to emphasize the importance of explanations in class discussions, projects and assignments, and on a variety of assessments. (05/04/2017)
			Action Category: Teaching Strategies
			
			Follow-Up: Data collected during the Spring 2017 semester for PLO #2 indicates that the target for success has once again been met. (08/25/2017)

	TARGET FOR SUCCESS The Math for Teachers Committee has determined that 70% of students attaining a rubric score of 3 as the target of success.		

PLOs	Assessment Method Description	Results	Actions

deviation higher this semester for all groups of students (Math 110/115/116, Math 110 only, and Math 115/116) than what was been reported in years past. This information indicates that in each of the subgroups, the average rubric score is lower and a higher standard deviation indicates that there is more variance (less consistency) than in previous years. We conclude that some students are able to explain the concepts and procedures of mathematical topics and problems while others still find this task difficult. (05/04/2016)
Faculty Assessment Leader: Judy Kasabian
Faculty Contributing to Assessment: Judy Kasabian, Susie Tummers, Susanne Bucher
Courses Associated with PLO Assessment: Math 110, Math 115, Math 116

Semester of Current Assessment: 2014-15 (Spring 2015)
Standard Met: Standard Met
For PLO #2, we looked at the mean and standard deviation for three groups.

Math 110, Math 115, and Math 116: Mean = 3.08 and standard deviation = 0.78
Math 110 only: Mean = 3.0 and standard deviation = 0.83
Math 115 and Math 116 only: Mean = 3.17 and standard deviation = 0.65
The means and standard deviations for the entire group of students as well as the subset of students are consistent with past semesters. Overall, students are reaching the target for success.

The correlation between the number of student absences and combined PLO scores was computed for three groups.

Math 110, Math 115, and Math 116: Pearson Correlation Coefficient = -0.23 which indicates no correlation
Math 110 only: Pearson Correlation Coefficient = -0.30 which indicates no correlation
Math 115 and Math 116 only: Pearson Correlation Coefficient = -0.21 which indicates no correlation. (04/30/2015)

Action: We are still curious the about the correlation between the number of student absences and performance on PLO #2. We plan to continue to look at this data each spring to see if a correlation remains the same or changes over time. (05/20/2016)
Action Category: Teaching Strategies

Follow-Up: Data collected during the Spring 2016 semester for PLO #2 indicates that the target for success has once again been met. (05/04/2016)

PLOs	Assessment Method Description	Results	Actions
		Faculty Assessment Leader: Judy Kasabian **Faculty Contributing to Assessment:** Susanne Bucher, Trudy Meyer, Susie Tummers **Courses Associated with PLO Assessment:** Math 110, Math 115, and Math 116	

PLO #3 Analyzing Mathematical Problems and their Solutions - Students will be able to analyze a solution to a mathematics problem, determine the appropriateness of the solution, and if errors are made, explain the misconceptions or errors made and how to solve the problem correctly using written and oral means.
 PLO Status: Active
 PLO Assessment Cycle: 2013-14 (Spring 2014), 2014-15 (Spring 2015), 2015-16 (Spring 2016), 2016-17 (Spring 2017), 2019-20 (Spring 2020)
 Input Date: 07/01/2013
	Multiple Assessments - To assess this SLO, faculty teaching Math 110, Math 115, and Math 116 will use tests, quizzes, class activities, projects, homework, and writing assignments to determine the level of success students' have reached regarding this PLO.
	 Standard and Rubric: The following rubric will be used to assess this PLO.
	
	 Score of 4: Students demonstrate a keen understanding of the representation of the answers to a variety of problems in written and oral means. Students are able to provide a clear and complete explanation of the appropriateness of answers to problems in written and oral means. Students are able to provide a clear and complete explanation of the misconceptions or errors made in problems using written and oral means.
	
	 Score of 3: Students demonstrate a good understanding of the representation of the answers to a variety of problems in written and oral means. Students are able to provide a good explanation of the appropriateness of answers to problems in written
		Semester of Current Assessment: 2013-14 (Spring 2014)
		 Standard Met: Standard Met
		 DATA
		 The data for this PLO is reported below.
		
		 Math 110, 115, and Math 116 (99 students)
		     26 (26%) scored a 4
		 47 (47%) scored a 3
		 25 (25%) scored a 2
		 1 (2%) scored a 1
		
		 73% of the students completing Math 110, 115, and 116 scored a 3 or 4. Standard was met.
		
		 Math 110 Only (43 students)
		     8 (19%) scored a 4
		 22 (51%) scored a 3
		 13 30%) scored a 2
		 0 (0%) scored a 1
		
		 70% of the students completing Math 110 scored a 3 or 4. Standard was met.
		
		 Math 115 and 116 (56 students)
		     18 (32%) scored a 4
		 25 (45%) scored a 3
		 12 (21%) scored a 2
		 1 (2%) scored a 1
		
		 77% of the students completing Math 115 and 116 scored a 3 or 4. Standard was met.
		
		 ANALYSIS
		 The data indicates that students completing Math 110,
			Action: We plan to examine how attendance impacts student performance on each of the three PLOs. We contend that if students are not in class, they not only miss mathematics content, but more importantly miss the opportunity to explore and investigate the underpinnings of a mathematical idea, discuss how think and reason mathematically, discover the connections within mathematics and between mathematics and other disciplines, and explain the concepts in their own words. We plan to examine the correlation between student attendance and their rubric score for each of the PLOs. We will collect this data at the end of the semester and report the findings on the next cycle of PLO assessment. (05/15/2015)
			 Action Category: SLO/PLO Assessment Process
			
			 Follow-Up: During the spring 2015 semester, we examined the correlation between the number of student absences and achievement on PLO #1. We combined the scores for PLO #1, PLO #2, and PLO #3 to produce a SUM of PLO Scores. We then

PLOs	Assessment Method Description	Results	Actions

and oral means.
Students are able to provide a good explanation of the misconceptions or errors made in problems using written and oral means.

Score of 2:
Students demonstrate a limited understanding of the representation of the answers to a variety of problems in written and oral means. Students are able to provide a limited explanation of the appropriateness of answers to problems in written and oral means. Students are able to provide a limited explanation of the misconceptions or errors made in problems using written and oral means.

Score of 1:
Students are unable to demonstrate the representation of the answers to a variety of problems in written and oral means.
Students are not able to provide an explanation of the appropriateness of an
Additional Comments: No additional comments.

Math 115, and Math 116 are able to reach the standard of success for this PLO. Asking students to examining the reasonableness of their answer requires students to understand the underlying concepts that serve as the foundation for the problem. Determining what might be an expected answer (e.g. a prediction, hypothesis, or estimation) requires higher order thinking skills and content knowledge make a sound judgment. For prospective teachers, it is essential that they become competent in looking at a solution of the problem, determining the mistakes made, deciphering the misconceptions, and determining an appropriate way to help someone solve the problems correctly. This is what teachers do every day. The students in Math 110, Math 115, and Math 116 have the opportunity to examine mathematics through this lens and it is not an easy task to complete successfully. We have come to know that it takes time and a great deal of practice to make headway on this endeavor. Most other mathematics courses do not focus on this task so our students come to the Math for Teachers Program courses with little or no experience finding errors and deciphering misconceptions in work completed by others. In addition, we notice that if students do not regularly attend class, there are obvious gaps in their understanding of the mathematics topics being investigated, limited experience probing mathematical ideas through inquiry activities, and little time to discuss mathematical ideas with their peers and instructor.
 (04/24/2014)
Faculty Assessment Leader: Judy Kasabian
Faculty Contributing to Assessment: Susanne Bucher, Judy Kasabian, Trudy Meyer, Susie Tummers
Courses Associated with PLO Assessment: Math 110, Math 115, Math 116

looked at three groups and computed the Pearson Correlation Coefficient to determine if there is any correlation between the number of student absences and assessment of the PLOs.

We compiled the data for three groups and the data and implications are listed below.

Math 110, Math 115, and Math 116: Pearson Correlation Coefficient = -.23 which indicates no correlation.

Math 110 only: The Pearson Correlation Coefficient = -.30 which indicates that there is no correlation.

Math 115 and Math 116 only: The Pearson Correlation Coefficient = -21 which indicates that there is no correlation.

Even though the Spring 2015 semester did not reveal any correlation between absences and achievement on PLOs, we plan to continue to examine this idea in future semesters. (04/30/2015)

Follow-Up: Many students are less familiar and experienced analyzing solutions to problems and determining the reasonableness of the answer. Instructors in the Math for Teachers Program devote class time to this endeavor at

PLOs	Assessment Method Description	Results	Actions
			appropriate times during the semester. Our concern is that students who miss class meetings may not spend the time to explore this PLO and may not receive the guidance of the instructor and classmates to be competent in the PLO. We will explore this idea during the spring 2015 semester when we collect data not only about student performance on this PLO but the impact (correlation) of number of absences on PLO performance. (04/08/2015)
	Multiple Assessments - To determine the score (using the scoring rubric) for each student in Math 110, Math 115, and Math 115, instructors use tests, quizzes, projects, group work, group discussions, and activities. **Standard and Rubric:** Score of 4: • Students demonstrate a keen understanding of the representation of the answers to a variety of problems in written and oral means. • Students are able to provide a clear and complete explanation of the appropriateness of answers to problems in written and oral means. • Students are able to provide a clear and complete explanation of the misconceptions or errors made in problems using written and oral means. Score of 3: • Students demonstrate a	**Semester of Current Assessment:** 2016-17 (Spring 2017) **Standard Met:** Standard Met Math 110, Math 115, Math 116 Mean = 2.94 Standard Deviation = 0.51 Pearson Correlation Coefficient: -.05 Correlation Conclusion: There is no correlation between number of absences and PLO #3. Average Number of Absences: 1.82 Sample Size: 72 Math 110 Only Mean = 2.94 Standard Deviation = 0.75 Pearson Correlation Coefficient: -.042 Correlation Conclusion: There is no correlation between number of absences and PLO #3. Average Number of Absences: 1.80 Sample Size: 52 Math 115 and Math 116 Only Mean = 2.90 Standard Deviation = 0.63 Pearson Correlation Coefficient: .10 Correlation Conclusion: There is no correlation between	**Action:** We strongly believe that this learning outcome is challenging for all mathematics students and also a necessary skill for those who plan to be classroom teachers. We will continue to diligently offer students many opportunities, through classroom discussions, projects and activities, and on assessments, to strengthen their skills and knowledge of this learning outcome. We will continue to offer our students challenging problems and sufficient time to practice these skills so that they will be able to utilize these skills in their own classrooms once they become teachers. In addition, the average number of absences for students enrolled in Math 110, Math 115, and Math 116 has decreased as compared to the students in these

PLOs	Assessment Method Description	Results	Actions
	good understanding of the representation of the answers to a variety of problems in written and oral means. • Students are able to provide a good explanation of the appropriateness of answers to problems in written and oral means. • Students are able to provide a good explanation of the misconceptions or errors made in problems using written and oral means. Score of 2: • Students demonstrate a limited understanding of the representation of the answers to a variety of problems in written and oral means. • Students are able to provide a limited explanation of the appropriateness of answers to problems in written and oral means. • Students are able to provide a limited explanation of the misconceptions or errors made in problems using written and oral means. Score of 1: • Students are unable to demonstrate the representation of the answers to a variety of problems in written and oral means. • Students are not able to provide an explanation of the appropriateness of answers to problems in written and oral means. **Additional Comments:** No room in the Standard and Rubric to present	number of absences and PLO #3. Average Number of Absences: 1.87 Sample Size: 20 At least 70% of the students in Math 110, 115, and 116 have reached the benchmark of a score of 3 or higher. Unlike Spring 2016, the mean for Math 115 and Math 116 students is lower than what is typically exhibited. This may be a function of these students or a trend to watch for. Regardless, we will continue to keep a close eye on this data or any trends and examine how we can assist students improve on this PLO. We contend that this important skill for all classroom teachers develops over time and we are pleased to see that students in Math 115 and 116 show stronger performance on this learning outcome. (08/25/2017) **Faculty Assessment Leader:** Judy Kasabian **Faculty Contributing to Assessment:** Judy Kasabian, Susie Tummers, Susanne Bucher **Courses Associated with PLO Assessment:** Math 110, Math 115, Math 116	courses during the Spring 2016 semester. We acknowledge that even though the data is limited, we continue to be encouraged with this trend and will examine this trend over time. (08/25/2018) **Action Category:** Teaching Strategies **Follow-Up:** Instructors in the Math for Teachers program continue to offer students many opportunities, through classroom discussion, projects, activities and assessments to strengthen their ability to analyze a solution and determine the misconception a student may have. (09/05/2018)

		Semester of Current Assessment: 2015-16 (Spring 2016)
		Standard Met: Standard Met
		RESULTS
		
		Math 110, Math 115, Math 116
		    Mean = 2.82
		    Standard Deviation = 0.86
		Pearson Correlation Coefficient: -.22
		Correlation Conclusion: There is no correlation between number of absences and SLO #3.
		Average Number of Absences: 2.57
		Sample Size: 92
		
		Math 110 Only
		    Mean = 2.55
		    Standard Deviation = 0.82
		Pearson Correlation Coefficient: -.04
		Correlation Conclusion: There is no correlation between number of absences and SLO #3.
			Action: We strongly believe that this learning outcome is challenging for all mathematics students and also a necessary skill for those who plan to be classroom teachers. We will continue to diligently offer students many opportunities, through classroom discussions, projects and activities, and on assessments, to strengthen their skills and knowledge of this learning outcome. We will continue to offer our students challenging problems and sufficient time to practice these skills so that they will be able to utilize these skills in their own

PLOs	Assessment Method Description	Results	Actions

	the Standard for Success.
	
	The Standard for Success is 70% attainment.
		Average Number of Absences: 2.55
		Sample Size: 55
		
		Math 115 and Math 116 Only
		  Mean = 3.22
		  Standard Deviation = 0.75
		Pearson Correlation Coefficient: -.44
		Correlation Conclusion: There is no correlation between number of absences and SLO #3.
		Average Number of Absences: 2.51
		Sample Size: 37
		
		The mean data for students in Math 115 and 116 are higher than those for Math 110 only students and the entire group of students in Math 110, 115, and 116. We contend that determining the reasonable of answers and examining misconceptions in mathematics problems is a difficult task and are emphasized significantly throughout the Math 110, 115, and 116 sequence. Most students begin this sequence in Math 110 and we except that their level of performance of this PLO will be lower than students who are enrolled in Math 115 and 116 since they have had significantly more practice at this task. We contend that this important skill for all classroom teachers develops over time and we are pleased to see that students in Math 115 and 116 show stronger performance on this learning outcome. (05/04/2016)
		Faculty Assessment Leader: Judy Kasabian
		Faculty Contributing to Assessment: Judy Kasabian, Susie Tummers, Susanne Bucher
		Courses Associated with PLO Assessment: Math 110, Math 115, Math 116
			classrooms once they become teachers. (05/04/2017)
			Action Category: Teaching Strategies
			Follow-Up: Data collected during the Spring 2017 semester for PLO #3 indicates that the target for success has once again been met. (08/25/2017)

		Semester of Current Assessment: 2014-15 (Spring 2015) **Standard Met:** Standard Met The mean and standard deviation for PLO #2 was computed and reported in three groups. Math 110, Math 115, Math 116: Mean = 3.09 and standard deviation = 0.78 Math 110 only: Mean = 3.02 and standard deviation = 0.78	**Action:** Even though there was no correlation between the number of student absences and performance on PLO #3, we plan to continue to examine this correlation to see how these findings hold up over time.

PLOs	Assessment Method Description	Results	Actions
		Math 115 and Math 116: Mean = 3.21 and standard deviation = 0.68

Our findings indicate that students, in a collective group and also in the subgroups, did much better in explaining mathematical concepts than students in the Spring 2014 semester. Each group of Math for Teachers students is unique and this group was successful in meeting the target for success.

In addition, we examined the correlation between the number of student absences and performance on the PLOs. We combined the scores for PLO #1, PLO #2, and PLO #3. We looked at three groups:
Math 110, Math 115, and Math 116: Pearson Correlation Coefficient = -0.23 which indicates no correlation.
Math 110 only: Pearson Correlation Coefficient = -0.3 which indicates no correlation.
Math 115 and Math 116 only: Pearson Correlation Coefficient = -0.21 which indicates no correlation. (04/30/2015)
Faculty Assessment Leader: Judy Kasabian
Faculty Contributing to Assessment: Susanne Bucher, Trudy Meyer, Susie Tummers
Courses Associated with PLO Assessment: Math 110, Math 115, Math 116 | (05/20/2016)
Action Category: Teaching Strategies

Follow-Up: Data collected during the Spring 2016 semester for PLO #3 indicates that the target for success has once again been met. (05/04/2016) |

Assessment: Assessment Unit Four Column

Spring/Summer 2016

El Camino: PLOs (MATH) - Pre-Engineering

PLOs	Assessment Method Description	Results	Actions
PLO #1 Academic Success Strategies - Students will analyze the preparation, assess the cognitive skills, and apply academic success strategies required in engineering. **PLO Status:** Active **PLO Assessment Cycle:** 2013-14 (Spring 2014), 2015-16 (Spring 2016), 2017-18 (Spring 2018), 2019-20 (Spring 2020) **Input Date:** 07/01/2013	**Essay/Written Assignment -** Students were asked to write a one page essay describing the preparation, training, practice, obligations, and ethics required in the engineering profession. **Standard and Rubric:** The rubric was based on a 4 point scale with the lowest being 0, corresponding to No Understanding, 1 corresponding to Some Understanding, 2 corresponding to Most Understanding, and 3 corresponding to Complete Understanding. Students who earned a 2 or 3 were deemed Successful at mastering the PLO, while those scoring 0 or 1 were Unsuccessful. If a student correctly analyzed just one of the concepts listed in PLO #1, the student would earn 1 point, if the student analyzed three of the ideas listed, the student would earn 2 points, and if they analyzed all five correctly, they would earn 3 points, which is the maximum. Since the last time that students were assessed for PLO #1, which was during the Spring 2013 semester, no students earned a	**Semester of Current Assessment:** 2013-14 (Spring 2014) **Standard Met:** Standard Not Met This Spring 2014 semester out of the total 26 students enrolled in the one and only section of Engineering 1 , no students earned a score of 0 or 1, while 7 students (27%) earned a score of 2, and 19 students (73%) earned a score of 3. Since the success rate for this PLO was 100%, no improvement is possible in the overall student success rate. However, the target of 75% success at the Complete Understanding level, corresponding to a score of 3 was not met. The instructor suggested that students need to be encouraged to comprehend and address the question completely and provide answers for all elements in the question. Also, the instructor plans to emphasize and repeat important issues. This course, Engineering 1, which corresponds to Program Level Outcome #1, is designed to stimulate student interest in pursuing a career in the field of Engineering. Assessments conducted in the course consist of multiple choice and short answer exams, as well as essay questions. There are no mathematical or engineering type problems to be solved in the class, nor is there a prerequisite for the course. There is only one section of the course offered each semester. Also, since there has been only one instructor teaching the course for the past number of years, there are no colleagues who also teach the course, who could benefit from his suggestions. Based on the nature of the course, there is no need to change the PLO statement. (05/27/2014) **Faculty Assessment Leader:** William Latto	**Action:** Emphasize and repeat important issues (05/27/2015) **Action Category:** Teaching Strategies **Follow-Up:** The SLO assignment was made more detailed and students were given highly detailed directions to complete SLO assignment. (10/04/2016)

| | score of 0 or 1, 36% earned a score of 2, 64% earned a score of 3, the success rate was 100%. For this Spring 2014 semester, because the 100% success rate cannot be improved upon, the target was set for 75% of the students to earn a score of 3, corresponding to complete understanding. | **Faculty Contributing to Assessment:** Milan Georgevich
Courses Associated with PLO Assessment: Engineering 1 | |

Essay/Written Assignment - Based on this semester long project, you will write a report that will cover following aspects of engineering profession for which you are planning to study.

1.   What academic preparation is required for an engineering professional planning to graduate in the area in which you are planning your engineering study? (If you have not chosen an engineering or computer science major, then you can write about academic preparation for a general engineering degree). Discuss in terms of areas of concentrations during the study program and key courses related to those areas of concentrations. Discuss as to what would be the best quality academic preparation.
Read Rest of the details in the attached document.
Standard and Rubric: Grading Rubric:
1. What academic preparation is required for an engineering professional planning to graduate in the area in which you are planning your engineering study?   2

Semester of Current Assessment: 2015-16 (Spring 2016)
Standard Met: Standard Met
Number of students assessed: 28
Table below gives score distributions.

Score percentage or range	Number of students in that range	Percentage of Students in each range (%)
100%	1	3.6
90 % to <100%	5	17.9
80% to <90%	9	32.0
70% to <80%	7	25.0
60% to <70%	3	10.7
50% to < 60%	1	3.6
<50%	2	7.2
Total	28	100.0

The table below shows the statistics of above data:

Statistical Property	Value of Statistical Property
Highest	100%
Average	77%
Median	82%
Standard Deviation	21%
Lowest	0%

Action: Add more writing assignments to Engineering 1 class. (10/04/2017)
Action Category: Teaching Strategies

PLOs	Assessment Method Description	Results	Actions

points

2. What post academic training would be needed for a successful engineering career by an engineering professional planning to practice the branch of engineering of your interest?   2 points

3. Analyze and describe the typical practice day, week, and month of a practicing engineer in the area of your interest. What kinds of practice problems would such an engineer solve on daily, weekly, and monthly basis?   2 points

4. What ethical responsibilities would an engineer in your area of interest would have and how would he/she meet them? How would such an engineer resolve ethical dilemma? What sacrifices might an engineer have to make to meet ethical responsibility?   2 points

5. What kinds of professional, civic, and social obligations an engineer in your area of interest would have? How would he/she meet those obligations?   2 points

Percentage of Students passing (70% or above)   79%

The low standard deviation in second table shows a high confidence in the average and/or median value. In fact the median being the central tendency of data is so impressive that median value did not change even after outlier datum was removed from the analysis. Using data without outliers, about 4/5th or 80% of the Engineering 1 students met the criterion for successful completion. About 1/5th of the class or more precisely 20% of the class did not meet successful completion standard. The percentage meeting successful criterion improves once outlier data are removed from the statistical analysis.

The graphical presentation of student SLO scores shows a skewed bi-modal distribution. However, if two outliers are removed, then data seems to have a good quality Gaussian distribution, with central tendency around 85% score. We are establishing a success criterion in engineering courses, that if 70% of students achieve 70% or higher in SLO tests, then goal of SLO has been met.

The following reasons can be cited for the underperformance (be it not passing, or barely passing).
1.   Poor quality writing skills.
2.   Poor quality or inadequate research skills.
3.   Poor communication skills.

We will talk about the 3rd reason first. In the project, students were asked to interview an industry engineer and an engineering professor in the area of their interest. The poor performers were not able to, on account of poor communication skills, even able to come up with required interviews. This despite the fact, that all students were given the contact information of two industry speakers who gave guest lectures in the class. [They could have contacted them at least]. It is also possible that poor performers simply realized that engineering is not their cup of tea. Certainly in a community college environment, such self-discovery can be done, because fortunately the environment in community colleges is a low risk one.

PLOs	Assessment Method Description	Results	Actions
		For the students who met the SLO target, I think they communicated well with the instructor and their interviewers, understood class lectures, studied the supporting materials and learned overall art of researching, analyzing, and writing. The student's not meeting success standards could have been due to combination of factors. Typical factors we have seen hindering student success in community colleges are: 1. Lack of engagement. 2. Demanding work and college schedule. 3. Sudden change in student's life condition that required attention and time resources to be redirected from studies towards resolution of such condition. (10/04/2016) **Faculty Assessment Leader:** Satish Singhal **Faculty Contributing to Assessment:** Satish Singhal **Courses Associated with PLO Assessment:** Engineering 1 **Related Documents:** Spring2016PLO_And_SLO_ReportForEngr1.docx	
	Multiple Assessments - Students were assessed through projects, essays, and exams. **Standard and Rubric:** 75% are expected to score a 2 or a 3 for the SLO.	**Semester of Current Assessment:** 2017-18 (Spring 2018) **Standard Met:** Standard Met For Engineering 1 the overall combined success rate for students from all 3 sections was: 56.1% (32/57) for complete understanding; 21.1% (12/57) for most understanding; 22.8% (13/57) for some understanding; 0% (0/57) for no understanding. Thus the overall student success rate for SLO 1 for Engineering 1 was 77.2% (44/57), while 22.8% (13/57) were unsuccessful. The results show that students understand the preparation, training, practice, and ethics of the Engineering profession. Those students that did not succeed, did not complete the required assignments related to this SLO. (08/30/2018) **Faculty Assessment Leader:** Masoud Zahedi **Faculty Contributing to Assessment:** Masoud Zahedi, Wayne Cottrell, John Swanson, Milan Georgevich **Courses Associated with PLO Assessment:** ENGR 1	**Action:** Instructors are encouraged to use real life examples, in order for students to see applications in the Engineering field. (08/30/2019) **Action Category:** Teaching Strategies