Assessment: Course Four Column

Fall 2018

El Camino: Course SLOs (MATH) - Math (Math and Science Majors)

ECC: MATH 170:Trigonometry

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 UNDERSTANDING CONCEPTS - Students will explain and demonstrate basic trigonometric concepts and definitions. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Fall 2014), 2018-19 (Fall 2018) **Input Date:** 11/21/2013	**Exam/Test/Quiz -** Right Triangle Trigonometry - A student stands 20 feet from the base of a tree and looks up at the top of a tree with an angle of elevation of 60 degrees. Find the height of the tree. **Standard and Target for Success:** Our target goal for success on SLO #1 is that 70% of the students will score a 2 or a 3 based on the following rubric: 0 –No understanding (no relevant math) 1 –Some understanding (label, or sketch, or some correct equation) 2 –Most understanding (all from 1 and solve) 3- Complete understanding (all from 1 and 2 and round and state answer)	**Semester and Year Assessment Conducted:** 2018-19 (Fall 2018) **Standard Met? :** Standard Met 332 Students participated in this SLO assessment. Results: Score 0 – No understanding (17 students): 5% Score 1 – Some understanding (37 students): 11% Score 2 – Most understanding (44 students): 13% Score 3 – Complete understanding (234 students): 71% 84% of students scored 2 or 3 on the assessment and therefore, we did meet the standard of success for the SLO. Results by section: out of 12 sections responding to this SLO, 9 reported that their class did not meet expectations, while 3 sections report that their class did meet expectations. Hence, 75% of section instructors report success. Expected/desired standard of success: at least 75% with most or complete understanding. This SLO assessment asked students to explain and demonstrate basic trigonometric concepts and definitions. Specifically, the students were asked to find the height of a tree given the distance to the base and the angle of	**Action:** As most students were able to do this kind of problem, the course of action is to continue to reinforce the basics, repetition and work on harder problems in class. (03/17/2019) **Action Category:** Teaching Strategies **Follow-Up:** Though the previous suggestion was to use a harder problem, we decided, in light of the new placement process due to AB 705, to keep the same problem. This way, the previous SLO scores serve as a baseline to which we can compare the incoming SLO scores for Fall 2019. Should these new scores turn out to be lower than the previous scores, we can then look to see what actions we may need to take in order to raise student's success to previously achieved levels. Should the new scores be higher, we can change the problem and increase the level of

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		elevation. Future suggestions: This is a basic standard problem. Students should be able to take the written problem, draw an appropriate diagram, use the correct trig function, and solve for the variable. Most students can do this. (03/17/2019) **% of Success for this SLO:** 84 **Faculty Assessment Leader:** Oscar Villareal **Faculty Contributing to Assessment:** Diaa Eldanaf, Michael Bateman, Pavan Nagpal, Christina Watson, Timothy Ferguson, Judy Kasabian, Susan Tummers, Michael Zeitzew, Aida Ovanessian, Oscar Villareal.	difficulty at the next SLO assessment. (11/18/2019)
		Semester and Year Assessment Conducted: 2014-15 (Fall 2014) **Standard Met? :** Standard Met Here are the results from assessing a total of 214 students from 7 sections (0832, 0834, 0836, 0840, 0842, 0844, 0846): 157 students or 73.3% scored a "3" 22 students or 10.3% scored a "2" 19 students or 8.9% scored a "1" 16 students or 7.5% scored a "0" This mean a total number of 179 students out of 214 students passed the SLO #1. Therefore, the success rate for SLO #1 in FA 2014 is 84%. Here are some comments from instructors participating in the assessment of this SLO: Since 28 students scored a 2 or 3, the success rate was 74%. My expectation was a success rate of 75%, which is close to what was achieved. The problem that was used for this SLO was an application problem, which resulted in a number of students who scored 0 or 1, hardly attempting it. The next time that this SLO is assessed, with this type of application problem, I plan to introduce the topic with students attempting the problem at their desks, in collaboration with their classmates. The difficulty with the trigonometry course is that there are too many mandatory topics to be covered, with insufficient time available. This hinders the	**Action:** Since 84% of the students did very well on this SLO, next time we will increase the rigor of the application problem. (12/07/2018) **Action Category:** SLO/PLO Assessment Process

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		use of much collaborative work. One student couldn't get the diagram right. That means he's not sure what an angle of elevation is. Another student got the diagram, yet he didn't continue working on it to find the height. Another student also got the diagram right, yet she made a mistake on definition II for cosine when finding the height. (With the given information, simply she's supposed to use tangent.) And, the rest of the students made no mistakes. The students didn't meet my expectation since my target success rate of at least 90% was not met. In lecture, I walked the students through several examples on angle of elevation, and used definition II for trigonometric functions to solve the problems. The examples are from exercises (even problems) in the textbook. I assigned them odd problems that are comparably difficult. I wrote exams that reflected materials gone over in class. I put this SLO question on the final exam. I also did a review before the final. For the review, I went over elevation angle and definition II-related problem. Those who showed up for the review scored 100% on this SLO question. Those who didn't show up and didn't take the class seriously did poorly on it. To improve the result, I'll do more application problems involving in angle of elevation and definition II in class, assign more homework problems, write the students practice exam questions, and encourage the students to come for the exam review. I am pleased with the SLO results. This class is one of the weakest classes I have had in some time and I expect that many of them will not pass the class, so I am not concerned that 30% of them did not pass the SLO. If they want to succeed in trigonometry, I am confident that most of those 30% will repeat the class and have a second chance at learning this skill along with several other skills they are currently missing.	

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		Overall, my students did very well on this question. The majority of them drew a picture or diagram to help them better understand the question. This shows me that my use of diagrams on questions solved during class was very beneficial for my students. Somewhat interesting is the fact that the students were divided into two camps for solving the question with roughly half approaching it as a right triangle and using the tangent function while the other half approached it using the more advanced technique of the law of sines. This shows that students were able to choose a method that they were comfortable with when faced with a problem. In the future, I will keep with the same approach and hopefully achieve similar results. Students met my expectations on this SLO. I also had the students draw a picture to increase the understanding of the question being asked. (01/29/2015) **Faculty Assessment Leader:** Gregory Fry **Faculty Contributing to Assessment:** S. Tummers, M. Georgevich, B. Mitchell, T. Meyer, R. Heng	
	Exam/Test/Quiz - The following question or equivalent was asked in an exam or quiz. "Right Triangle Trigonometry - A student stands 20 feet from the base of a tree and looks up at the top of a tree with an angle of elevation of 60 degrees. Find the height of the tree." **Standard and Target for Success:** Our target goal for success on SLO #1 is that 70% of the students will score a 2 or a 3 based on the following rubric: 0 –No understanding (no relevant math) 1 –Some understanding (three or		

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	four mistakes) 2 –Most understanding (one or two mistakes) 3- Complete understanding (all correct)		

ECC: MATH 180:Pre-Calculus

Course SLOs	Assessment Method Description	Results	Actions
SLO #1 UNDERSTANDING CONCEPTS - Students will explain and demonstrate basic precalculus concepts by solving equations, inequalities and systems involving algebraic, exponential, logarithmic, trigonometric, and absolute value expressions. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Fall 2014), 2018-19 (Fall 2018) **Input Date:** 11/21/2013	**Exam/Test/Quiz -** Test Question: Given the polynomial function: P(x)=x^4-2x^3-2x^2-2x-3 A) List all possible rational zeros of P(x) using Rational Zeros Theorem. B) Find all zeros of polynomial .Whenever appropriate, use quadratic formula or other factoring techniques. Alternate Test Question (used by only one section): Given the polynomial function: g(x)=12x^3+2?8x?^2+17x+3 A) List all possible rational zeros of P(x) using the Rational Zeros Theorem. B) Use Synthetic Division to determine exactly one rational root. C) Use previous methods to determine the remaining roots. D) Clearly state all of the roots. **Standard and Target for Success:** This SLO was not previously tested under the old SLO Structure. So our goal this semester is that 70% of these students will score a "2" or a "3" on this SLO using the following rubric: Category 0 –No understanding (incorrect answers to part A and B) 1 –Some understanding (correct answer to part A only) 2 –Most understanding (answer to both parts with some computational	**Semester and Year Assessment Conducted:** 2014-15 (Fall 2014) **Standard Met? :** Standard Met There are 11 sections, totaling of 334 students in math 180 that participated in SLO#1 during Fall 2014. The distribution of scores is the following: 47.3% (158 students) scored a “3” , 36.0% (120 students) scored a “2”, 9% (30 students) scored a “1”, and 7.7% (26 students) scored a “0”. The overall success rate is 83.3% and 16.7% did not pass. Section: 0874: ANALYSIS: The students did well with part (A) since the method for listing the possible zeroes is in the SLO. They also had ample practice with this method. For part (B), about half of the students were only able to find the rational roots, and either erred in finding the complex roots or forgot them completely. I think more examples in class may help with remembering to find all zeroes instead of just the rational zeroes. Section: 0876: ANALYSIS: Since 92% of the students scored a 2 or 3, which corresponds to being successful, my expectations of their performance were considerably exceeded. Only 8% of the students, namely 3 of them, scored a 0 or 1, and thus, were unsuccessful. When presenting this topic, I had students work a number of problems at their desks, in collaboration with their classmates. Section: 0884: ANALYSIS: These results did not meet my expectations. I put a similar problem on the 3 exams they had during the semester. We even reviewed this type of problem during the last class meeting. However, I did not give them a 3 if they wrote their answer in factored form. Also, a few	**Action:** Overall, the students did pretty well in finding the zeros of polynomial functions. Next time, we want to increase the rigor of the SLO by using harder functions such as trigonometric, logarithmical or exponential. (11/30/2018) **Action Category:** SLO/PLO Assessment Process **Follow-Up:** We did use exponential functions in the next SLO test question, and it worked out pretty well as about 76% of students were able to obtain a score of 2 or higher. Students seem ready for the increase in rigor. (01/15/2016)

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	mistakes) 3- Complete understanding (correct answer to part A and B with no mistakes) **Related Documents:** Math 180,summary ,fall 2014.docx	students made very tiny errors in writing their final answers such as writing 1 instead of -1 even though their work shows -1. I did not give them a 3 as well. I think maybe next time I will also add problems related to the SLO in their homework throughout the semester so they don't forget how to do the problem.	
		Section: 0880: ANALYSIS: The results exceeded my expectations. The results are from the final exam. I put a similar question on every exam throughout the semester making it the fourth time they have seen a similar problem. During the last class meeting I showed the stats of the first set of results and the third set of results to the class and voiced my expectations/goals for that type of question on the final exam. I encouraged them to at least move up one level and that I would like to see 20 score in level 3. I think these results are much better also because students that were failing did not bother to show up for the final (a total of 5), in which case they would be similar to previous results. Section: 0866: No comments Section: 0864: No comments Section: 0862: ANALYSIS: I'm satisfied with my student's results; 80% earned a '2' or '3. This was a good question. Student's responded well to the use of Ti-84 calculators to double check their results. Section: 0870: ANALYSIS: Overall the result is good since 83% of the students scored a 2 or 3. What worked: I went over this concept for 3 hours in class, which correspond to sections 3.3, 3.4 and 3.5, a study guide was given to practice for the test, and I did three problems	

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		similar to the SLO question during the review session the day before the test. Even though 83% is a very good passing rate but to increase that , next time I will warn the students on reading and working the problems on study guide carefully and assigned extra problems on the study guide for them to practice at home. Section: 0860: ANALYSIS: 61% of the students scored a 2 or 3. Although I went over this concept for 3 hours in class, which correspond to sections 3.3, 3.4 and 3.5, a study guide was given to practice for the test, and I did three problems similar to the SLO question during the review session the day before the test, the results were not as I expected. I am teaching two sections of math 180 this semester .This class meets at 7:00AM with passing rate of 61% and the other class meets at 11:30am with the passing rate of 83%. Next time, I will warn the students on reading and working the problems on study guide carefully and assigned extra problems on the study guide for them to practice at home, but still the main cause of this low passing rate is the early morning time of class. The students that are taking their classes so early usually leave the campus to go to their work and do not spend enough time on their studying, so I don't see how I can improve their success rate if they are not willing to do their part. Section: 0872: ANALYSIS: Most students were able to answer part A correctly. Many only found the real roots, so they were given a score of "2." This was one of the last topics taught before the test, and students probably needed more time to completely master this material. What worked: Going over the big picture of graphing the function – knowing end behaviors and the shape of the graph. Then covering Rational Roots Theorem and Descartes Rule of Signs, to help locate real zeros. What didn't work so well: Focusing too much on graphing the function led to students stopping when they had all the	

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		Real roots. I needed to emphasize the need to find imaginary roots too. Section: 0882: In order to have more students score 2 or higher I need to spend more minutes teaching this concept to students. I will give students more practice problems for homework. I will also have students explain this concept to each other in class.	
	Exam/Test/Quiz - Suggested Test Problem & Scoring Rubric (how to assign 3,2,1,0): Given the polynomial function: P(x)=x^4-2x^3-2x^2-2x-3 A) List all possible rational zeros of P(x) using Rational Zeros Theorem. B) Find all zeros of polynomial, some of which could be complex. Rubric: 3 – all correct 2 – one or two mistakes 1 – three or four mistakes 0 – no understanding **Standard and Target for Success:** 70% score 2 or 3 points.	(01/15/2015) **Faculty Assessment Leader:** Aban Seyedin **Faculty Contributing to Assessment:** A. Seyedin, E. Barajas, J. Epstein, A. Hockman, M. Mata, M. Geogevich, M. Cortrz, A. Adalinda **Semester and Year Assessment Conducted:** 2018-19 (Fall 2018) **Standard Met? :** Standard Met Analysis: 270 Students participated in this SLO assessment. Score 0 – No understanding (20 students) : 7% Score 1 – Some understanding (54 students): 20% Score 2 – Most understanding (65 students): 24% => 73% of students scored 2 or more Score 3 – Complete understanding (131 students): 49% 73% of students scored 2 or 3 on the assessment and therefore, the standard of success (70%) for the SLO was met. Results by section: out of 11 sections responding to this SLO, 7 reported that their class did not meet expectations, while 4 sections report that their class did meet expectations. Hence, 64% of section instructors report success. Notes on reported success: One section's instructor regards 100% of students as the standard for success. Two other	**Action:** Include more examples in class and in homework. Revisit the topic on various days and in a variety of modes (discussion, worksheets, homework, exam review, etc...). (02/01/2020) **Action Category:** Teaching Strategies

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		sections reporting unsuccessful results used a different SLO question for assessment. Expected/desired standard of success: at least 70% with most or complete understanding. This SLO assessment included the use of the Rational Roots Theorem and either synthetic or long division to factor a polynomial completely. Future suggestions: More practice on similar exercises would be helpful. If practice is spread out over multiple days and modes (class discussion, class practice, homework, exam review, etc...) material comprehension would likely improve. Assessment analysis: Q1: Did your students meet your expectations on this SLO? Why or why not? (Avila) "My students met my expectations. The students who scored a 1 or a 0 were students who had frequent absences." (Bateman) "My expectations are that students study hard and answer the problem with a complete understanding of the material. My expectations will never be fully met as many of the students today are not devoting time to the course outside of class." (Fanelli) Yes. 13 out of 18 of these students (72%) demonstrated most or complete understanding. This meets my expectation of at least 70%. (Fanelli) Yes. 23 out of 30 of these students (77%) demonstrated most or complete understanding. This meets my expectation of at least 70%. (Georgevich) Since only 57% of the students scored 2 or 3, which corresponds to being successful for this SLO, they did not meet my expectations. The function that I used for the exam, though of only degree 3 (the suggested problem was degree 4), had quite a few possible rational roots. This tripped up a number of the students. (Georgevich) Since only 61% of the students scored 2 or 3, which corresponds to being successful for this SLO, they did not meet my expectations. The function that I used for the	

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		exam, though of only degree 3 (the suggested problem was degree 4), had quite a few possible rational roots. This tripped up a number of the students. (Gui) "I think students in this section meet my expectation on this SLO since the passing rate (score 2 or 3) is 82.3% which is above the targeting rate of 70%. There are still about 17.7% of students who are unsuccessful. They mainly struggled with finding the possible rational zeros of polynomial function using Rational Zeros Theorem, which is the beginning of the process of finding polynomial zeros. Some of them didn't even try, the rest of them only listed some of the possible rational zeros correctly. Among those students who listed some of the possible rational zeros correctly, they either didn't use or try to use synthetic division to verify if the possible rational zero is the real one." (Morales) Yes. Over 80% of the students who attempted the SLO question earned at least a 2. (Taylor) No. Too many had a poor understanding of the concept. (Wang) The result meets the expectation. Q2: What teaching methods / strategies did you find particularly effective with regards to this assessment? I gave this problem in the final. The strategy that helped students retain and understand the concept was by revisiting previous material taught. "I gave handouts to the students and had them do the problems in class so I can verify both solutions and answers." "Students were informed that this topic (rational roots/polynomial factoring) would be tested. I distribute worksheets during lecture for students to practice and I assign online homework. I allow students to	

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		request extensions on homework when they are up to date on new material. This is meant to encourage review of content for improved comprehension on assessments. Students also receive practice material before exams in either printed or online (WebAssign) formats. Since the success rate was only 57%, no teaching method was apparently effective. Since the success rate was only 61%, no teaching method was apparently effective. "I found out that it is more effective for me when I break down the whole process of finding all zeros of polynomial function into steps and help them to get familiar with each step through practicing them individually. After that, it is effective to have them practice comprehensive problems by using this whole process. I also notice that having students work in groups and coming to the board to solve problems seems to work well." Class discussions and group work seemed to help students understand the content. With regards to the concept, the physical demonstration was effective for some, but obviously not enough. Quiz the students often. Q3: How might you consider improving the student learning of this assessed topic in the future? I will consider improving this topic by having students find all zeros using the rational zeros theorem, graph the function and then identify all real zeros through a graph. I will then ask then to determine if there are any complex zeros and have students explain how they found those complex zeros. My hope is that all students will have complete understanding of the concepts by using visuals	

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		and by applying the concept. Encourage more study time outside of class. Ensuring that students do their work (worksheets, homework, review) and know they should check their work for errors. Next semester, I might consider students working these types of problems in pairs and explaining their work to each other. "More student-centered! I will try to give them more problems to work on in and out class. Practicing more!" Provide more group discussion/homework problems or assessing the students within a week of covering this topic. I will try more contextualized examples. Continue to quiz more often, Overall: Instructors note that additional student practice of all forms is the best way to improve performance in the future. Classwork and discussion is suggested so that interpretations may be considered and presented amongst students individually or in groups. Participation by students in these activities is important. (03/01/2019) **Faculty Assessment Leader:** Dominic Fanelli **Faculty Contributing to Assessment:** A Avila, M Bateman, D Fanelli, M Georgevich, L Gui, E Morales, S Taylor, L Wang	

ECC: MATH 190:Single Variable Calculus and Analytical Geometry I

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 UNDERSTANDING CONCEPTS - Students will explain and demonstrate the idea of the limit, the derivative and the integral. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Fall 2014), 2018-19 (Fall 2018) **Input Date:** 11/21/2013	**Exam/Test/Quiz -** Test Question: Show that if f(x)=-x^2+4, then f'(-1)=2 by using the limit definition of the derivative. (That is, by using the difference quotient). Alternate test question: Find the value of f'(x) given f(x)=2/(x^2 + 5) using the limit definition of the derivative. (That is, by using the difference quotient). **Standard and Target for Success:** This SLO was not previously tested under the old SLO structure. So our goal this semester is that 70% of these students will score a '2' or a '3' on this SLO using the following rubric: Category: 0- No understanding (problem is left blank or work shows little indication of conceptual understanding of the difference quotient). 1- Some understanding (students may identify the proper definition of the difference quotient but applying the definition to the given function was unsuccessful. Little conceptual understanding of the difference quotient limit is evident.) 2- Most understanding (the	**Semester and Year Assessment Conducted:** 2014-15 (Fall 2014) **Standard Met? :** Standard Met 1/22/2015 – There were 10 sections assessing this SLO during Fall 2014. The distribution of scores is as follows: 7.4% earning score of 0 (23 students), 13.4% earning score of 1 (42 students), 25% of students earning a score of 2 (78 students) and 54.2% of students earning a score of 3 (169) students. The overall success rate is 79.2% (students earning a score of 2 or 3). We successfully achieve our target percentage for success. Analysis from various sections of Math 190: Section 0914 Over ½ of the students understood the concept, making no errors or only minor algebraic errors. Only a few (2) students had "most understanding", in these cases they appeared to understand the concept, but their algebra skills were not very good. Those that got "some understanding" had weak algebra skills as well as not having a good understanding of what they were doing. They didn't understand the difference quotient or they failed to realize that they were taking a limit. Overall, those students appeared to have missed the concept of the derivative being a limiting slope. Section 0912 A discussion and group activity at the blackboard proved to be helpful in bolstering student understanding of this SLO and topic. Section 0910 We went over the definition on two separate days and students were provided with a practice worksheet that gave them the opportunity to find the derivate at a value for	**Action:** 1/22/2015 – Overall the students did pretty well in utilizing the definition of the derivative. Next evaluation we would like to change the type of function being evaluated. Instead of using a polynomial function – perhaps we will increase the rigor and utilize a basic rational function or radical function (thus changing the algebra techniques required to evaluate the limit of the difference quotient. (05/12/2015) **Action Category:** SLO/PLO Assessment Process **Follow-Up:** Increasing the difficulty to using a rational function in conjunction with the limit definition of the derivative shows that students need further refining of basic algebra skills such as factoring and combining rational expressions using common denominators. An instructor reports a 54% success rate with such a test problem. (11/01/2017)

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	correct limit definition is applied to the function and the steps shown indicate the student comprehends the majority of the steps necessary to simplify the difference quotient in an attempt to evaluate the limit. Perhaps one or more algebra errors cause the result to come out incorrect.) 3- Complete understanding – The student obtains the correct value of the limit of the difference quotient by utilizing the proper algebraic process.	several different types of functions, including quadratic functions. Since this was the last topic covered before the test, students did not have time to forget the method. I will continue doing the same thing. Section 0920 The success rate for this SLO is 76%. Most of the students met my expectation because I really emphasized how difference quotients are used for various situations. I lectured and encouraged student interaction, and since this strategy was successful, I plan to continue using it. If we have more time, I will give them more examples to practice in class. Section 0906 The success rate for this SLO is 89%. Most of the students met my expectation because I really emphasized how difference quotients are used for various situations. I lectured and encouraged student interaction, and since this strategy was successful, I plan to continue using it. If we have more time, I will give them more examples to practice in class. Section 0904 Students did quite well as many examples were shown in class. Although, more emphasis on homework is needed. Section 0902 Students met my expectations on this SLO. The question was a fairly fundamental one for Calculus I, so we have been doing plenty of examples in class and there are many questions on the homework that are similar to it. So it was particularly helpful to give them lots of practice on the question by giving them the problem in many different forms. Next time, I might try giving students worksheets in class on the fundamental topics, so that they have more practice in class, when I can give them advice on the problems. (01/22/2015) **Faculty Assessment Leader:** Michael Bateman	

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		Faculty Contributing to Assessment: M. Bateman, J. Ng, J. Evensizer, L. Ho, A. Minasian, Stein, Joe M., A. Hockman, A. Sheynstein, R. Taylor	
	Exam/Test/Quiz - One of the two problems will be assessed. A particle moves on a line with velocity function v(t)=t^2-t, where v is measured in meters per second. Find the displacement of the particle during the time period [0,5]. Find the distance traveled during the time period [0,5]. Consider f(x)=2x/(x + 5) (a) Find the derivative using one of the two limit definitions of the derivative. (b) Find the equation of the tangent line to f(x) when x=-4 Rubric: 3 – all correct 2 – one or two mistakes 1 – three or four mistakes 0 – no understanding **Standard and Target for Success:** We would like to see over 65% of the students score a 2 or 3 out of the assessment.	**Semester and Year Assessment Conducted:** 2018-19 (Fall 2018) **Standard Met? :** Standard Met Score 0-19 (10%) Score 1- 26 (13%) Score 2-57 (29%) Score 3-96 (48%) 77% scored a 2 or 3 meeting our assessment goal. (02/28/2019) **Faculty Assessment Leader:** Michael Bateman **Faculty Contributing to Assessment:** Gizaw,Hamza,Meyer,Lewis,Ho,Morales,Villareal,Dean	**Action:** Next evaluation we would like to change the type of function being evaluated. Instead of using a polynomial or rational function – perhaps we will increase the rigor and utilize a transcendental function. (03/08/2020) **Action Category:** SLO/PLO Assessment Process

ECC: MATH 191:Single Variable Calculus and Analytical Geometry II

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 UNDERSTANDING CONCEPTS - Students will explain and demonstrate advanced integration techniques and convergence of sequences and series. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Fall 2014), 2018-19 (Fall 2018) **Input Date:** 11/21/2013	**Exam/Test/Quiz -** Test Question: (a) Determine if the sequence converges - if yes, then determine where it converges: a_n = (3^n+1)/4^n (b) Determine if the given series converges - if yes, then determine the sum of the series: Sum (n=0 to infinity) (3^n+1) / 4^n Alternate Test questions: Find the interval of convergence for the given series: Sum (n=1 to infinity) (1/3x + 2)^n / 7n^2 Alternate series problems for determining the interval of convergence: Sum(n=1 to infinity) (2n)^n / n^(2n) Sum (n=1 to infinity) (n!)^n / (2n)! **Standard and Target for Success:** This SLO was not previously tested under the old SLO structure. So our goal this semester is that 70% of these students will score a '2' or a '3' on this SLO using the following rubric: Category: 0- No understanding (problem is left blank or work shows has no indication of conceptual understanding of the tests for convergence of series). 1- Some understanding (Little	**Semester and Year Assessment Conducted:** 2018-19 (Fall 2018) **Standard Met? :** Standard Met Twenty-two(11%) students scored 0, 36(19%) students scored 1, 50(26%) scored 2, and 84(44%) students scored 3. Question 1: Did your students meet your expectations on this SLO? Why or why not? TM: Yes, unfortunately, my students more than met my expectations. Many of the students in this particular class have particularly weak pre-requisite skills. 30% of these students were not able to successfully pass the gateway quizzes (one on basic derivative rules and one on basic integration techniques mostly from the previous course) though they had multiple times to pass it. In addition, on both of the major exams I gave, at least 20% of the students made basic algebra mistakes such as adding rational expressions without getting a common denominator and distributing powers (including square roots) over sums and differences. In actuality, I believe more students passed this SLO question than will pass the class. PY: 34 students out of 54 students understand the concept while 9 out of 54 have some understanding and 11 out of 54 has very limited understanding. The nine students who have some understanding could do better if they did not make an algebra mistake solving absolute value inequality. The five students who have most understanding were confused to determine the convergence at x=-3. KN: Yes my students met my expectations since 78% (25 out of 32 students) had almost or complete understanding of the topic.	**Action:** Next time we will test sequences, series, and power series again to see whether there is any improvement in student performance. (02/06/2020) **Action Category:** Teaching Strategies

Course SLOs	Assessment Method Description	Results	Actions
	conceptual understanding of the tests for convergence of series) 2- Most understanding (Students were able to apply the tests for convergence of series and the steps shown indicate that the student comprehends the majority of the steps necessary to test the given series for convergence. Perhaps one or more algebra errors cause the result to come out incorrect.) 3- Complete understanding (The student was able to apply the correct test for convergence of series with no algebraic mistakes).	BL: Students performed as expected. DF: Approximately 2/3 of students understood this concept on the day of assessment, which meets my expectation. BM: My class performed below my expectations. Overall, this section of 191 had very weak prerequisite skills. Their knowledge of limits, derivatives and even algebraic manipulation were very weak. This made it difficult to teach many of the harder 191 topics. For examples, in Sequences and Series, I always begin by discussing how similar sequences are to limit problems from 190. Unfortunately, many of the limit techniques they should have seen previously were not well understood. This mean that not only was the sequence section much harder than it should have been, but often on series problems the students couldn't get started because they struggled with limits. Overall Analysis: 70% of 192 students who participated in SLO Assessment score 2(Most understanding) or 3(Complete Understanding). 30% of students who scored 0(No understanding) or 1(Some understanding) struggled due to their weak foundation in algebra as well as limit and derivatives from Math 190. Question 2: What teaching methods / strategies did you find particularly effective with regards to this assessment? TM: The assessment I used was for geometric sequences and series. This semester, instead of following the examples led by the author and instead of using the formula he provided, I simplified it by teaching them how to recognize a geometric sequence by looking at the common ratio of the terms and then I taught them that the sum of a convergent geometric series is simply the first term (no matter the indexing on the series) divided by 1 – the common ratio. PY: I taught the concept multiple days with multiple	

Course SLOs	Assessment Method Description	Results	Actions
		examples until the majority of students grasp the concept. KN: Particularly effective was having students practice similar problem types in class (without reliance on Google or a solutions manual). BL: Lot's of examples and practice. DF: I assessed this SLO using the alternate question: power series. Students received worksheets and we thoroughly discussed and practiced power series strategy with many examples. BM: I made a table demonstrating the differences between sequences and series, showing the different ways that they can diverge or converge. I think this helped a lot of the students who were in the middle in terms of understanding. Unfortunately, it still didn't' click with the students who were really struggling… Overall Analysis: Students perform much better when we thoroughly discuss and practice power series strategy with many examples. Question 3: How might you consider improving the student learning of this assessed topic in the future? TM: I do not have plans to further their understanding of geometric sequences and series beyond the modification I already made. However, I plan on looking into the effective methods my colleagues used on the alternate question. I feel my students would not have done as well on that question. PY: I would like to focus on students who have limited understanding giving them more personal attention. KN: To improve student learning of this topic, I would have	

Course SLOs	Assessment Method Description	Results	Actions
		students create their own series and show convergence or divergence. BL: More practice. DF: Continued discussion and practice among students in groups and as a class. BM: I plan to spend more time at the beginning of 191 reviewing 190 skills. I want to make sure that the students have a much stronger foundation before diving into the more challenging parts of 191. Overall Analysis: Pay more attention on students who struggle with algebra skill and limit & derivatives, and practice power series with more examples. (02/06/2019) **% of Success for this SLO:** 70 **Faculty Assessment Leader:** Paul M. Yun **Faculty Contributing to Assessment:** Trudy Meyer(0948), Paul Yun(0946 & 0950), Kris Numrich(0956), Bob Lewis(0944), Dominic Fanelli(0952), Ben Mitchell(0954)	
		Semester and Year Assessment Conducted: 2014-15 (Fall 2014) **Standard Met? :** Standard Met There were 7 sections assessing this SLO during Fall 2014. A total of 160 students participated in this SLO assessment. The distribution of scores is as follows: 13.125% earning score of 0 (21 students), 14.375% earning score of 1 (23 students), 32.5% of students earning a score of 2 (52 students) and 40% of students earning a score of 3 (64) students. The overall success rate is 72.5% (students earning a score of 2 or 3). We successfully achieve our target percentage for success.	**Action:** Overall the students who participated in this SLO assessment did well in utilizing the tests for convergence of a sequences and series. Five out of the seven sections used a geometric sequence and series to be tested for convergence. For the next evaluation, instead of using a geometric series, we would like to use a series that requires students to use a test for convergence other than the geometric series test. We may use a series that can be tested for

Course SLOs	Assessment Method Description	Results	Actions
		Sec 9030 This is an improvement over previous semesters. I have spent more time on this concept in lecture. Students need to spend more time studying. Section 0932 The Students did well on this question. The students were exposed to a wide variety of examples. In order to improve they need to do more of the homework problems. I will assign and create more problems for them to practice. Section 0934 The students who consistently do their homework, come to office hours, and go to MESA also consistently do well on the class assessments. Although I was pleased with the results, I know the 6 students who did not do well are capable of learning the material Section 0940 My students' success rate on this SLO is 69% since 20 out of 29 students passed this SLO. This is a bit below my expectation since I was expecting 70% of the students would pass this SLO. I noticed that more students got part (b) series correct than part (a) sequence correct. This is because they applied the Nth Term Test on sequence instead of series. In the future, I will take some time to review sequence before the exam, so they don't confused sequence with series. Section 0936 22 students out of 25 were able to apply the tests for convergence of sequence and series to the given sequence and the given series. The 10 students who received a score of 2 were able to apply the test for convergence correctly but they made some unexpected algebraic mistakes. The 3 Students whose scores were 0 or 1 did not complete their homework and missed several class lectures. I will keep encouraging students to do their homework assignment daily, participate in class discussions, seek help when	convergence using the ratio or the integral tests. (01/30/2015) **Action Category:** SLO/PLO Assessment Process **Follow-Up:** With regards to our initial assessment of the geometric series convergence / divergence behavior, continuing to assess different convergence / divergence tests (success rate around 60%) reveals a need to continue developing ways to increase student confidence and understanding in this topic. Since the idea involves a lot of abstraction, continuing to develop handouts and emphasizing students express the steps in complete statements with the proper terminology becomes very important. (11/06/2017)

Course SLOs	Assessment Method Description	Results	Actions
		something is unclear or difficult and never miss a class lecture. Overall the class met the target percentage for success. Section 9042 I'm not sure what to say. Given that most of the students did exceptionally well on this problem, the 6 students who did not, probably did not complete their homework or seek help when they did not understand the material. No one asked the kinds of questions in class that would indicate total confusion. I'm not sure what I could have done to assist these students, other than encourage them to ask for help and to work very hard on their homework until they are sure they understand the concepts. I'm pretty sure that the students who did not understand this particular problem also had trouble with other problems on this exam as well as the other exams. This was not an isolated incident for them. Section 0944 The students did not meet my expectation on this SLO assessment. For something as basic as this, I would have expected that at least more than half the class would have complete understanding, and that definitely less than 5% or 10% would have no understanding. Why someone would not see that the series was the sum of two geometric series, each of which has a common ratio whose absolute value is less than 1, and hence convergent, is very surprising to me. The next time I teach this class, I will be giving more quizzes, and also collecting and grading select homework problems. I hope that this type of result never happens again. (01/30/2015) **Faculty Assessment Leader:** H. Hamza **Faculty Contributing to Assessment:** R. Lewis, J. Cohen, G. Fry, H. Hamza, L. Ho, J. Evensizer, R. Taylor	
	Exam/Test/Quiz - We assessed the following test/quiz problems:		

Course SLOs	Assessment Method Description	Results	Actions
	Prove the trigonometric identity: sin?/(1+cos?)+(1+cos?)/sin?=2csc? Scoring Rubric: 3 – all correct 2 – one mistake 1 – two mistakes 0 – no understanding **Standard and Target for Success:** Our goal is to obtain a 70% success rate on the SLO (that is, 70% or more students scoring a 2 or 3). **Exam/Test/Quiz -** (a) Determine if the sequence converges - if yes, then determine where it converges: a_n = (3^n+1)/4^n (b) Determine if the given series converges - if yes, then determine the sum of the series: Sum (n=0 to infinity) (3^n+1) / 4^n Alternate question: Find the interval of convergence for the given series: Sum (n=1 to infinity) (1/3x + 2)^n / 7n^2 Rubric: 3 – all correct 2 – one or two mistakes 1 – three or four mistakes 0 – no understanding **Standard and Target for Success:** We would like to see at least 70% of students score 2 or 3.		

ECC: MATH 210:Introduction to Discrete Structures

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 UNDERSTANDING CONCEPTS - Students will explain and demonstrate an understanding of the key principles of logic, number theory, combinatorics, probability and graph theory. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Fall 2014), 2018-19 (Fall 2018) **Input Date:** 11/21/2013	**Exam/Test/Quiz -** Suggested Test Question: Let set A be the set of all English logical statements. For all p and q in A, pRq ? (p?q is true). Determine if the relation is each of these and explain why or why not. (a) Reflexive (b) Symmetric (c) Transitive (d) Antisymmetric **Standard and Target for Success:** This is the first time we assessed this SLO under the new SLO structure. So our target goal this semester is that 70% of the students will score a "2" or a "3" on this SLO using the following rubric: 0 –No understanding (answered 1 out of 4 parts or none correctly). 1 –Some understanding (answered 2 out of 4 parts correctly). 2 –Most understanding (answered 3 out of 4 parts correctly). 3- Complete understanding (answered 4 out of 4 parts correctly).	**Semester and Year Assessment Conducted:** 2014-15 (Fall 2014) **Standard Met? :** Standard Met Category Number of students 0 –No understanding 0 1 –Some understanding 4 or 15% 2 –Most understanding 8 or 30% 3- Complete understanding 15 or 56% Total number of students 27 Overall 86% of the students passed the SLO and we met our target goal. The students did well on this question. They were exposed to several examples related to the classification of relations. In order to improve I will provide more examples, I will assign and create more homework problems for the students to work on. (01/15/2015) **Faculty Assessment Leader:** Greg Fry **Faculty Contributing to Assessment:** Greg Fry	**Action:** Overall, the students did very well on logic and relations. Next time, we want to assess a different topic such as number theory, combinatorics, probability or graph theory to check for full understanding of this SLO. (11/30/2018) **Action Category:** SLO/PLO Assessment Process
	Exam/Test/Quiz - Explain the difference between the quantifications: For every x there exists a y such that the predicate P(x, y) is true or for every y there exists an x such that the predicate P(x, y) is true Give an example of a predicates	**Semester and Year Assessment Conducted:** 2018-19 (Fall 2018) **Standard Met? :** Standard Met 70% scored 3 18% scored 2 10% scored 1 2 % scored 0 (01/28/2019) **% of Success for this SLO:** 78	**Action:** Math 210 faculty hope that they can provide more group activities involving this specific topic along with active activities involving students working on the board with these problems so that they can not only visually see the problems but

Course SLOs	Assessment Method Description	Results	Actions
	such that they have different truth values. (these are sentences that summarize the math symbols since they would not type here) **Standard and Target for Success:** It is expected that 70% or higher would score 2 or 3. Here is the rubric: 3- Student explains that in the first quantification the same x must work for every y, whereas in the second x can depend on y. Student gives a predicate P(x) that gives two different truth values for each quantification. 2- Student explains that in the first quantification the same x must work for every y, whereas in the second x can depend on y but the example of P(x) that the student gives is wrong. 1- Student does not explain or has irrelevant explanation but provides a relevant P(x) 0- Student has irrelevant explanation and wrong P(x)/ leaves problem blank.	**Faculty Assessment Leader:** Diaa Eldanaf **Faculty Contributing to Assessment:** Diaa Eldanaf, Angelica Santana	be able to fluently interpret these problems. (01/29/2020) **Action Category:** Teaching Strategies

ECC: MATH 220:Multi-Variable Calculus

Course SLOs	Assessment Method Description	Results	Actions
SLO #1 UNDERSTANDING CONCEPTS - Students will explain and demonstrate partial derivatives, multiple integrals and the major theorems of vector calculus. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Fall 2014), 2018-19 (Fall 2018) **Input Date:** 11/21/2013	**Exam/Test/Quiz -** I. ACTUAL QUESTIONS: Q1. (Faculty Paul Yun's SLO question) Find the partial derivative at (t, s) = (0, 0) for z =(e^y)(cos3x), x = 4t+s^3, y = t^5+3s+1. Q2. (Faculty Ashod Minasian's SLO question) Find the partial derivative at (t, s) = (0, 0) for z =(e^y)(cos3x), x = 4t+s^3, y = t^5+3s+1. Q3. (Faculty Robert Horvath's SLO question) Consider the function z = f(x, y) = (x^2)(e^y), x = t^2 − 1 , y = sin t. Use the Chain Rule to compute dz/dt as a function of t only (no x's and no y's in your final answer.) II.RUBRIC 0- No understanding (Student does not understand the core concept.) 1-Some understanding (Student has a vague idea on the core concept, and fails to carry out necessary calculation.) 2-Most understanding (Student understands the core concept, and makes a minor computational error.) 3-Complete understanding (Student understands the core concept, and solve the problem without an error.) **Standard and Target for Success:** It is expected that 80% of the students will score a 3 or 2.	**Semester and Year Assessment Conducted:** 2018-19 (Fall 2018) **Standard Met? :** Standard Met I. RESULTS 105 students participated in SLO assessment. 5 students or 5% scored a 0. 13 students or128% scored a 1. 29 students or 28% scored a 2. 58 students or 55% scored a 3. II. ANALYSIS 12/20/2018 Yes. Over 90% of the students demonstrated most understanding of the concept. 12/20/2018 Yes, the majority of my students showed most or complete understanding. 12/13/2018 I was expecting more students to show complete understanding based on the class discussions. I was expecting to have 20 students score 2 or 3 on the assessment. It that sense the students did not meet my expectations however, further analysis of the work showed that 5 of the students that scored '1' demonstrated a common error in partial derivatives. These students made arithmetic errors with negatives when calculating. In that sense then if I focus mainly on the basic idea then, I would say that 21 out of 24 students met the requirements. In that sense the class as a whole DID meet my expectations. (01/16/2019) **% of Success for this SLO:** 80 **Faculty Assessment Leader:** Ashod Minasian **Faculty Contributing to Assessment:** Jeff Cohen, Gerardo Sandoval	**Action:** Action: Giving conceptual exercises and group classwork during classroom meetings, with instructor's supervision. I would make an effort to have students explain the derivation of the formula to calculate the partial derivatives often and frequently. I would also take more time to explain the meaning of the partial derivative in an attempt to have students not rely too much on the formula and be able to derive it themselves during an exam or other assessment. Assign more practice problems, as this is basically just a skill that requires practice, as opposed to conceptual understanding. (01/16/2020) **Action Category:** Teaching Strategies
		Semester and Year Assessment Conducted: 2014-15 (Fall 2014) **Standard Met? :** Standard Met I. RESULTS	**Action:** 1. Since the majority of students understand the concept, we will continue the similar teaching strategy.

Course SLOs	Assessment Method Description	Results	Actions
	Related Documents: SLO Fall 2014 - Math 220 over all blank.docx SLO Fall 2014 - Math 220 overall.docx	85 students participated in SLO assessment. 2 students or 2% scored a 0. 7 students or 8% scored a 1. 10 students or 12% scored a 2. 66 students or 78% scored a 3. II. ANALYSIS 1. Due to their strong foundation in differentiation from single variable calculus courses math 190 and math 191, they could easily learn partial derivatives. A brief review of differentiation was helpful to students. 2. The majority of students understand partial derivatives. (11/16/2014) **Faculty Assessment Leader:** Paul Yun **Faculty Contributing to Assessment:** Ashod Minasian & Robert Horvath **Related Documents:** SLO Fall 2014 - Math 220 over all blank.docx ACTION for Math 220 SLO for Fall 2014.docx	2. Flip-n-teach and teach-n-flip. 3. For the nine students who scored a 0(No understanding) and a 1(Some understanding) , we need to encourage to put in their effort and to study hard. We also need to encourage the students who have work related issues to balance time between study and work. For those who have health related issues, we need to encourage them to take care of their health first before they enroll in an intense course like Math 220 multivariable calculus. (12/11/2015) **Action Category:** Teaching Strategies **Follow-Up:** Applying some suggestions from other instructors, putting students in groups and emphasizing students be mindful of their health and time commitments continues to show promise. Our previous assessment of partial derivatives had a high success rate so future assessments of this SLO should involve multivariate integration or another related topic to get a broader idea of student comprehension of multivariable calculus techniques. (11/01/2017)
	Exam/Test/Quiz - Exam/Test/Quiz I. ACTUAL QUESTIONS: Q1. (Faculty Paul Yun's SLO question) Find the partial derivative at (t, s) = (0, 0) for z =(e^y)(cos3x), x = 4t+s^3, y = t^5+3s+1.		

Course SLOs	Assessment Method Description	Results	Actions
	Q2. (Faculty Ashod Minasian's SLO question) Find the partial derivative at (t, s) = (0, 0) for z =(e^y)(cos3x), x = 4t+s^3, y = t^5+3s+1. Q3. (Faculty Robert Horvath's SLO question) Consider the function z = f(x, y) = (x^2)(e^y), x = t^2 – 1 , y = sin t. Use the Chain Rule to compute dz/dt as a function of t only (no x's and no y's in your final answer.) II.RUBRIC 0- No understanding (Student does not understand the core concept.) 1-Some understanding (Student has a vague idea on the core concept, and fails to carry out necessary calculation.) 2-Most understanding (Student understands the core concept, and makes a minor computational error.) 3-Complete understanding (Student understands the core concept, and solve the problem without an error.) **Standard and Target for Success:** Standard and Target for Success It is expected that 80% of the students will score a 3 or 2.		

ECC: MATH 270:Differential Equations with Linear Algebra

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 UNDERSTANDING CONCEPTS - Students will explain and demonstrate the key concepts of linear algebra, including determinants, vector spaces and linear transformations. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Fall 2014), 2018-19 (Fall 2018) **Input Date:** 11/21/2013	**Exam/Test/Quiz -** Test Question (Used by S. Taylor) : Let V be the vector space of 2 x 2 symmetric matrices with Real entries. a) Show that dimV = 3 b) Find a basis for V. Test Question (used by J. Evensizer): Let W denote the set of all 2 x 2 matrices whose trace is zero. a) Show that W is a subspace of M2(R) b) Find a basis for and the dimension of W. **Standard and Target for Success:** This SLO was not previously tested under the old SLO structure. So our goal this semester is that about 60% of the students attain good to excellent understanding of the problem using the following rubric: Scoring Rubric: 3 - Excellent - Students demonstrate complete understanding of the concepts of basis and dimension and can apply them to examples such as a space of symmetric matrices or matrices with trace zero. 2 - Good - Understanding of the general concepts of basis and dimension is apparent. Perhaps there is some flaw in the reasoning of the proof structure and/or notation. Perhaps not all axioms of subspace were verified in the proof.	**Semester and Year Assessment Conducted:** 2014-15 (Fall 2014) **Standard Met? :** Standard Not Met There were 2 sections of Math 270 participating in this SLO during Fall 2014. The distribution of scores is as follows: 27% (20) students earned a score of 3, 11% (8) students earned a score of 2, 54% (40) students earned a score of 1, and 8% (6) students earned a score of 0. Due to a small sample size for this advanced math course, we get a variety of results depending on the nature of the SLO problems and the materials used to teach the course. One section (0970) had a bit more trouble with the SLO and this could be a due to a variety of reasons. In this case it is imperative we consider the following: Most textbooks spend far too much time dealing only with linear spaces consisting of n-dimensional vectors with Real (or Complex) components and hardly any time at all with linear spaces whose elements are functions or matrices or infinite sequences or whatever. They usually even call them vector spaces, further reinforcing the R^n concept. Thus it is only natural for students to try to make a basis using elements from R^n, even when the elements of the vector space are something else. Section(0970): Many students wrote a set of 2x1 vectors as the bases for 2x2 symmetric matrices - in this case earning little to no credit. Many did identify the dimension as the number of basis elements however we did not feel this was sufficient for a score of 2 on the problem. The concept will be emphasized further in class and may be utilized again on the term final exam. Section 0972: The students did well. I emphasize over and	**Action:** 1/29/2015 - Overall, we got some mixed results with the SLO. We would like to see closer to 60% of the students reach the good to excellent understanding on the SLO when assessed again. The course is quite advanced and requies a substantial amount of abstract thinking for our higher level STEM students. Continuing to have the students work individually and collaboratively on problems related to basis and vector spaces will help improve performance. (01/29/2018) **Action Category:** SLO/PLO Assessment Process **Follow-Up:** Students worked individually and collaboratively on linear algebra problems related to determinants, vector spaces, basis and linear transformations in order to develop and acquire abstract thinking skills. It is recommended that we continue to help our STEM students sharpen their mathematical analytical skills while discussing the linear algebra concepts so that they can succeed in their future academic courses and careers. (01/27/2018)

Course SLOs	Assessment Method Description	Results	Actions
	1 - Fair - Some understanding of the concept of basis and dimension is apparent but proving the proper axioms appears to be an issue. 0 - Unsatisfactory - LIttle to no understanding of basis and/or dimension of vector space is demonstrated.	over again that the basis must be made of elements of the space itself, so most of the students gave me a basis of 2 x 2 matrices with a trace of zero (or at least a basis of 2 x 2 matrices). Showing that it is a subspace and finding the dimension don't pose as much of a difficulty as finding an appropriate basis. (01/29/2015) **Faculty Assessment Leader:** J. Evensizer **Faculty Contributing to Assessment:** J. Evensizer, S. Taylor	
	Exam/Test/Quiz - On a quiz or exam one of the following problems was used: 1. Let V be the vector space of 2 x 2 symmetric matrices with real entries. Show that dimV=3 and find a basis for V. 2. Let W denote the set of al 2x 2 matrices whose trace is zero. Show that W is a subspace of M2(R), find a basis and the dimension of W. 3. Let S be the set of all 2 x 2 matrices of the form {{a,b},{b,c}}, where a,b,c are real. Show that S is a subspace of V the set of all 2 x 2 matrices with real entries, find a basis for S, and the dimension of S. **Standard and Target for Success:** The SLO was scored 0 for no understanding, 1 for some understanding, 2 for most understanding and 3 for complete understanding. This SLO was only tested once before with a target of 60% students passing with a score of 2 or 3. This time the target is 67%.	**Semester and Year Assessment Conducted:** 2018-19 (Fall 2018) **Standard Met? :** Standard Met In three sections of math 270, 84 students participated. Six students got a score of 0, no understanding; 22 students got a score of 1, some understanding; 37 students got a score of 2, most understanding and 19 students got a score of 3, complete understanding. This gave 56/84 or 67% passed with a score of 2 or 3. (03/27/2019) **% of Success for this SLO:** 67 **Faculty Assessment Leader:** Susan Taylor **Faculty Contributing to Assessment:** Susan Taylor, Ashod Manasian, Jim Stein	**Action:** We still need to improve on this critical concept of basis and dimension beyond subspaces of R^n. I will share this with other instructors of Math 270 and ask and disseminate the results. (03/27/2020) **Action Category:** Teaching Strategies
	Exam/Test/Quiz - A mixing problem. Using Matrices to solve a system of ordinary differential equations.		