



PROGRAM REVIEW – CURRICULUM REVIEW
2015-16

Transfer Level Mathematics

Courses with CID Designation

Course Name	CID #	CID Name	COR Effective Term
MATH G140	MATH 140	Business Calculus	F2014
MATH G160	MATH 110	Introduction to Statistics	Fall
MATH G160	SOCI 125	Introduction to Statistics in Sociology	S2012
MATH G180	MATH 211	Single Variable Calculus I Late Transcendentals	S2009
MATH G185	MATH 221	Single Variable Calculus II Late Transcendentals	F2009
MATH G280	MATH 230	Multivariable Calculus	F2014
MATH G282	MATH 240	Ordinary Differential Equations	F2012
MATH G285	MATH 910S	Differential Equations and Linear Algebra	F2015

Dual Listed Courses

Course Name	Dual Listed
N/A	

List of Active Courses offered or not offered in the last 3 years

Course Name	2012-2013			2013-2014			2014-2015		
	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring
MATH G100		X	X		X	X		X	X
MATH G104		X	X		X	X		X	X
MATH G115	X	X	X	X	X	X	X	X	X
MATH G120	X	X	X	X	X	X	X	X	X
MATH G140		X	X		X	X	X	X	X
MATH G155									
MATH G160	X	X	X	X	X	X	X	X	X
MATH G170	X	X	X	X	X	X	X	X	X
MATH G180		X	X	X	X	X	X	X	X
MATH G185		X	X	X	X	X	X	X	X
MATH G235			X			X			X
MATH G280		X	X		X	X		X	X
MATH G282		X			X				
MATH G285								X	



PROGRAM REVIEW – SLO ASSESSMENTS 2015-16

Transfer Level Mathematics

*Assessment status reflects assessments between Fall 2013 through Summer 2015

Assessment status for courses with active cSLOs

Course Name	# of cSLOs	# of cSLOs Assessed	Status
MATH G100	3	3	↑
MATH G104	3	3	↑
MATH G115	5	3	↔
MATH G120	5	4	↔
MATH G140	5	3	↔
MATH G155	8	0	↓
MATH G160	5	4	↔
MATH G170	4	4	↑
MATH G180	4	4	↑
MATH G185	4	4	↑
MATH G235	4	1	↔
MATH G280	4	3	↔
MATH G282	4	1	↔
MATH G285	6	1	↔

↑ Fully assessed
↔ Partially assessed
↓ No assessment

Courses with cSLOs that still need to be assessed

Course Name	cSLO #	cSLO
MATH G115	cSLO 1	List the potential rational zeros of a polynomial function.
MATH G115	cSLO 2	Determine the equation of the function that results from transformations applied to the graph of a given function.
MATH G120	cSLO 1	Evaluate function values of special angles given in both degree and radian measures without the use of tables or calculators.
MATH G140	cSLO 1	Calculate the elasticity of demand and interpret its implications for price manipulation.
MATH G140	cSLO 2	Use the concepts of differentiation and marginality to optimize cost, revenue, and profit functions.
MATH G155	cSLO 1	Analyze functions pertaining to business, management, social, behavioral, and life sciences.
MATH G155	cSLO 2	Apply Gaussian elimination and inverse matrix techniques to solve linear systems.
MATH G155	cSLO 3	Apply graphical and simplex techniques to solve linear programming problems.
MATH G155	cSLO 4	Apply permutation and combination formulas to solve counting problems.
MATH G155	cSLO 5	Calculate probabilities of independent and mutually exclusive events, conditional probability, Bayes Theorem, and Bernoulli processes.
MATH G155	cSLO 6	identify and determine the long-run behavior of regular and absorbing Markov Chains.
MATH G155	cSLO 7	Apply appropriate strategies to analyze and solve strictly determined and mixed strategy games.
MATH G155	cSLO 8	Apply appropriate financial formulas pertaining to compound interest, present and future value quantities.
MATH G160	cSLO 5	Calculate and interpret the p-value and significance level for a given data set.
MATH G235	cSLO 1	Given a matrix, find its rank and a basis for its row space and column space.
MATH G235	cSLO 2	Use the Gram-Schmidt process to transform a basis into an orthonormal basis.
MATH G235	cSLO 4	Use the definition of a vector space to show that a given set with defined operations of vector addition and scalar multiplication is not a vector space.
MATH G280	cSLO 4	Use Stokes' Theorem to find the flux of curl(F) across an oriented surface, given a vector valued function, F.
MATH G282	cSLO 1	Find the general solution to a second order nonhomogeneous linear differential equation.
MATH G282	cSLO 2	Use power series to solve an ordinary differential equation.
MATH G282	cSLO 4	Utilize matrices to solve systems of linear equations.
MATH G285	cSLO 1	Solve systems of linear equations using matrix algebra and row-reduction techniques.

Courses with cSLOs that still need to be assessed

Course Name	cSLO #	cSLO
MATH G285	cSLO 2	Prove theorems regarding vector spaces or subspaces.
MATH G285	cSLO 3	Compute the row space, null space, and column space of a matrix or a system of linear equations.
MATH G285	cSLO 5	Solve systems of linear differential equations using eigenvalues and eigenvectors.
MATH G285	cSLO 6	Solve initial-value linear differential equations using the Laplace transform methods.

Courses Assessed and their Action Plans

Course Name	cSLO #	Semester Assessed	Action Plans
MATH G100	cSLO 1	2014 - 2015 (Fall 2014)	Instructor comments: <ul style="list-style-type: none"> •The rubric needs to be modified •In order to improve results, in-class quizzes rather than online quizzes could be helpful...let students grade their own quizzes periodically. •Place more emphasis on the particular case of a FALSE hypothesis.
MATH G100	cSLO 1	2013 - 2014 (Fall 2013)	While the result of 60.4% of students scoring 70% or higher is lower than desired, 43/53 students (81%) were able to correctly set up the truth table. This shows that students have a good understanding of the concept and use of truth tables, but require more practice determining the truth values of various statements. The instructor will incorporate more practice into classwork or labs in the future.
MATH G100	cSLO 2	2013 - 2014 (Spring 2014)	The results show that the majority (26+23=49) students knew how to calculate the down payment, and they got confused with the POINTS. Therefore, more time should be spent in the class explaining and practicing similar problems.
MATH G100	cSLO 3	2014 - 2015 (Spring 2015)	Comments from Math G100 instructors include: "During lecture time, I will emphasize the importance of drawing geometric figures and accurately labeling the dimensions of the figure (including units) in order to analyze it and answer questions about area or volume." "In the future, I will include in-class activities that involve problems that require the students to recall a geometric formula, draw and label a geometric figure, compute an area for a two dimensional geometric figure, and compute the volume and surface area of a three dimensional geometric figure." "More emphasis in the geometry chapter."
MATH G104	cSLO 1	2014 - 2015 (Spring 2015)	In the future, I will include worksheets and in-class activities that involve problems that ask the student to find a percent and use the concept of percent to find a "mark-up" or "mark-down" quantity (including sales price, original price, old salary, new salary, etc.). I will also include in-class activities that involve using the simple interest and compound interest formulas to help improve student learning. During lecture, I will emphasize the technique of solving word problems using the 4-step method of 1) define the variable, 2) write an equation, 3) solve the equation, and 4) write a sentence answer and I will include in-class activities to practice this method.
MATH G104	cSLO 2	2013 - 2014 (Fall 2013)	Since the percentage of the students that answered the question completely correct is above 70%, I will continue implementing the methods that I used in this course.
MATH G104	cSLO 2	2014 - 2015 (Fall 2014)	Students have achieved at an acceptable rate, and we now move on to the next SLO.
MATH G104	cSLO 3	2013 - 2014 (Spring 2014)	Based on the outcome, I don't find the need to change anything.
MATH G115	cSLO 3	2014 - 2015 (Fall 2014)	More in class time to work with students and have them working in class, enabling the instructor to get feedback and know their weaknesses. Have students work together in groups will encourage them to learn better. More class time, less number of students in class, and providing tutoring outside of class time might help. I would like to not only show the students how to solve the system algebraically, but also graphically. I feel with the added visual of what a solution to a system looks like, more students will buy in to the process of solving the system algebraically
MATH G115	cSLO 3	2013 - 2014 (Fall 2013)	<ul style="list-style-type: none"> • Most students seem to understand the concept of solving the system of equations, and for those who do not, the concept will be reviewed. The trouble might lie more in the simple mistakes due to rushing and not being meticulous, or it could be due to test anxiety. • Future classes will emphasize test taking practice to help students overcome test anxiety, checking work, and careful solving of problems. • The department should continue assessing this SLO to understand both student and teacher development.

Courses Assessed and their Action Plans

Course Name	cSLO #	Semester Assessed	Action Plans
MATH G115	cSLO 4	2014 - 2015 (Summer 2014)	More in class time to work with students and have them working in class, enabling the instructor to get feedback and know their weaknesses. Have students work together in groups will encourage them to learn better. Most students are taking just one class in the summer. I think they are generally doing a bit better than regular semester class. The department should continue assessments.
MATH G115	cSLO 4	2013 - 2014 (Spring 2014)	Being my first year teaching this course and my first year at Golden West College, I overestimated how much the students would remember from their previous coursework. In the future I will more carefully assess what knowledge the students are entering the class with and factor that into my teaching. Specifically, I will include spiraled work and foundational reinforcement as appropriate based on this more careful assessment.
MATH G115	cSLO 4	2013 - 2014 (Spring 2014)	From the comments provided by the instructors: <ul style="list-style-type: none"> •Being my first year teaching this course and my first year at Golden West College, I overestimated how much the students would remember from their previous coursework. In the future I will more carefully assess what knowledge the students are entering the class with and factor that into my teaching. Specifically, I will include spiraled work and foundational reinforcement as appropriate based on this more careful assessment. •After giving the first assessment, I was able to pinpoint the mistakes in solving the SLO problems. The logarithmic equation had the highest success rate, but simple algebraic mistakes were made. Thus, I will need to review the algebraic skills necessary to solve an equation. I plan to spend more time explaining and using examples to solidify the concept of solving logarithmic equations that equal a constant opposed to another logarithm with the same base. •The department should have common finals for remediated math classes, and require students to pass the common finals in order to enter college algebra. •I plan to pass out a package of 60 questions of 20 different typical types of questions for College Algebra and require students to complete, and meet instructor for verbal and written assessments.
MATH G115	cSLO 4	2013 - 2014 (Spring 2014)	From the comments provided by the instructors: <ul style="list-style-type: none"> •Being my first year teaching this course and my first year at Golden West College, I overestimated how much the students would remember from their previous coursework. In the future I will more carefully assess what knowledge the students are entering the class with and factor that into my teaching. Specifically, I will include spiraled work and foundational reinforcement as appropriate based on this more careful assessment. •After giving the first assessment, I was able to pinpoint the mistakes in solving the SLO problems. The logarithmic equation had the highest success rate, but simple algebraic mistakes were made. Thus, I will need to review the algebraic skills necessary to solve an equation. I plan to spend more time explaining and using examples to solidify the concept of solving logarithmic equations that equal a constant opposed to another logarithm with the same base. •The department should have common finals for remediated math classes, and require students to pass the common finals in order to enter college algebra. •I plan to pass out a package of 60 questions of 20 different typical types of questions for College Algebra and require students to complete, and meet instructor for verbal and written assessments.
MATH G115	cSLO 4	2013 - 2014 (Spring 2014)	More in class time to work with students and have them working in class, enabling the instructor to get feedback and know their weaknesses. Have students work together in groups will encourage them to learn better. The department should continue assessments.
MATH G115	cSLO 4	2013 - 2014 (Fall 2013)	From the comments provided by the instructors: <ul style="list-style-type: none"> •More in class time to work with students and have them working in class, enabling the instructor to get feedback and know their weaknesses. •Have students work together in groups will encourage them to learn better. •Emphasize the importance of understanding the purpose of an inverse function, to “undo” another function. Solidify understanding how to solve a linear equation in one variable so that the students know what to do next.
MATH G115	cSLO 5	2014 - 2015 (Spring 2015)	<ul style="list-style-type: none"> •Have students work together in groups will encourage them to learn better.

Courses Assessed and their Action Plans

Course Name	cSLO #	Semester Assessed	Action Plans
			<ul style="list-style-type: none"> • I will need to create small in-class activities which will solidify a foundation of what type of hyperbola is listed or finding the center of the hyperbola. With this foundational skill, I believe the students will be able to be more successful with this particular SLO question. More class time, less number of students in class, and providing tutoring outside of class time might help. I will require students to take the assessment test to see which topic he /she needs to work on and provide an additional material for these students to practice and turn in. • I will offer more office hours. I will emphasize more on the topics belong to SLOs instead of covering all topics in the textbook
MATH G120	cSLO 2	2013 - 2014 (Fall 2013)	Review algebra skills. Review simplifying complicated trig rational expressions. The department should continue assessing this SLO.
MATH G120	cSLO 3	2014 - 2015 (Summer 2014)	The students have achieved an acceptable rate. However, I could give more class work for similar type of questions, so that I can improve results of student learning outcome.
MATH G120	cSLO 3	2013 - 2014 (Spring 2014)	I plan to spend more time elaborating the concept of a phase shift. I feel that concept is the hardest to justify when the argument of the trigonometric function is not given in the factored form. I also will review the concept of adding fractions.
MATH G120	cSLO 3	2013 - 2014 (Spring 2014)	I will provide a more balanced look at sine, cosine, and tangent graphs including identifying asymptotes on homework and tests in the future, and will provide my students with more opportunities to practice graphing trigonometry functions.
MATH G120	cSLO 3	2013 - 2014 (Spring 2014)	More in class time to work with students and have them working in class, enabling the instructor to get feedback and know their weaknesses. Have students work together in groups will encourage them to learn better. The department should continue assessments. More exercises on graphing Trig functions.
MATH G120	cSLO 3	2013 - 2014 (Fall 2013)	<p>Comments from the three instructors include:</p> <ul style="list-style-type: none"> • More class time to work with students and have them working in groups, enabling the instructor to get feedback and know their weaknesses. • Emphasize graphing one period, two periods, and also over certain intervals so that students can be fluid in graphing for any situation. • A "lightning round" in class may help, where a function is flashed on the screen and people have to write down the amplitude and period quickly. Do this for a few functions over a 1 or 2 minute period and see how the scores fare. • Informal/formal meetings with course instructors to ensure student proficiency in the area of graphing trigonometric functions. • Encourage the use of written worksheets in class to reinforce concepts used in graphing trigonometric functions, rather than relying on the graphs in the online homework component. • If time permits, return the problem to students and ask them to redo the portion that they did incorrectly. If possible, the instructor can retest students with similar problems.
MATH G120	cSLO 4	2014 - 2015 (Fall 2014)	<p>Instructors' comments regarding planned changes to improve student learning were:</p> <ul style="list-style-type: none"> •Employ group work or in-class assignments to promote student interactions and enable the instructor learn their weaknesses. •Properly manage class time in order to have adequate time to cover all course content. •Modify presentation of material by providing detailed explanations. •Use quizzes and in-class assignment to reduce then number of tardy or absent students. •Lead the students with more practice problems.
MATH G120	cSLO 5	2014 - 2015 (Spring 2015)	<p>Instructor Comments include the following:</p> <ul style="list-style-type: none"> •More in class time to work with students and have them working in class, enabling the instructor to get feedback and know their weaknesses. •Have students work together in groups will encourage them to learn better. •More class time, and providing tutoring outside of class time might help. The department should continue assessments. •The result shows that more than one-half of the students understood the concepts of solving the triangles, and they mainly made mistakes on the calculations. The students with no answer or completely wrong answers were about 5% for both questions which is not bad! •After analyzing the results, I will be creating worksheets and small assessments that focus on the Law of Cosines and the proof. I think I will have more successful students if they have

Courses Assessed and their Action Plans

Course Name	cSLO #	Semester Assessed	Action Plans
			<p>more time in class processing, manipulating, and calculating the angles and sides of triangles by utilizing the Law of Sines and Cosines while surrounded by their peers.</p> <ul style="list-style-type: none"> •I will offer more office hours. However, finding a location for office hours is always challenging since library's policy does not allow talking and faculty cannot check out the room. •I will emphasize more on the topics belong to SLOs instead of covering all topics in the textbook. •I realize that having students try a similar problem right after each example will allow students keep up with the lecture.
MATH G140	cSLO 3	2014 - 2015 (Summer 2014)	I plan to emphasize that consumers' surplus and producers' surplus are real life examples of computing the area between two curves and reinforce finding anti-derivatives of functions common to the calculation of consumers' surplus and producers' surplus.
MATH G140	cSLO 3	2013 - 2014 (Spring 2014)	I plan to emphasize that consumers' surplus and producers' surplus are real life examples of computing the area between two curves and reinforce finding anti-derivatives of functions common to the calculation of consumers' surplus and producers' surplus.
MATH G140	cSLO 4	2014 - 2015 (Fall 2014)	I believe students have achieved this objective since 82% of the students were successful. However, I would like to see this objective evaluated again to see if students achieve similar success levels.
MATH G140	cSLO 5	2014 - 2015 (Spring 2015)	I have not planned any changes because of this assessment. The achievement of 75.5% success rate indicates that the presentation and demonstration of this objective is an effective method of student learning.
MATH G160	cSLO 1	2013 - 2014 (Fall 2013)	The students have achieved an acceptable success rate for this SLO however; this SLO will continue to be assessed.
MATH G160	cSLO 2	2013 - 2014 (Spring 2014)	Continue methods of describing the normal distribution, but with an added emphasis on understanding how specific data values relate to mean, standard deviation, probability, and area.
MATH G160	cSLO 2	2013 - 2014 (Fall 2013)	In order to improve student learning concerning the normal distribution, instructors will plan to prepare handouts/worksheets that will give students more practice in correctly drawing, labeling, and shading areas that represent probabilities for the normal distribution. Additional written interpretations and/or conclusions for normally distributed random variables will be emphasized and critiqued.
MATH G160	cSLO 2	2013 - 2014 (Fall 2013)	In order to improve student learning concerning the normal distribution, instructors will plan to prepare handouts/worksheets that will give students more practice in correctly drawing, labeling, and shading areas that represent probabilities for the normal distribution. Additional written interpretations and/or conclusions for normally distributed random variables will be emphasized and critiqued.
MATH G160	cSLO 2	2013 - 2014 (Fall 2013)	In order to improve student learning concerning the normal distribution, instructors will plan to prepare handouts/worksheets that will give students more practice in correctly drawing, labeling, and shading areas that represent probabilities for the normal distribution. Additional written interpretations and/or conclusions for normally distributed random variables will be emphasized and critiqued.
MATH G160	cSLO 2	2014 - 2015 (Fall 2014)	Instructor's comments included the following: "I can use the results of this assessment, to ensure that my future Statistic students will demonstrate a higher success rate by doing more work sheets in the classroom and having more discussions in class. I plan to divide the large classes into small groups as they work on their worksheets in class. Getting the class engaged is very important in Large classes, so I'm exploring some options for higher retention rates. I noticed those students who were not successful had excessive absences. So enforcing attendance maybe the key." "The SLO requested the student to perform 4 tasks; find and interpret the probability, draw normal curve and shade requested region. I have found that many of the students have difficulty in completing all tasks. Many just do the last task requested. The homework does not stress the interpretation of the problems but the finding of the probabilities. Only in Hypothesis Testing is the interpretation highly stressed. More stress on the prob. interpretation will be done in the classroom."
MATH G160	cSLO 3	2014 - 2015 (Spring 2015)	Discuss the results with colleagues and continue to assess this cSLO with appropriate revisions. Also take into consideration the timing of conducting this cSLO and make adjustments as necessary.

Courses Assessed and their Action Plans

Course Name	cSLO #	Semester Assessed	Action Plans
MATH G160	cSLO 3	2013 - 2014 (Spring 2014)	Although the results of the assessment were satisfactory, some students had trouble selecting the correct test statistic, and some students had trouble writing a conclusion in clearly written English with the proper statistical vocabulary. Assigning some worksheets with handwritten hypothesis tests might improve overall performance. Although, this would be burdensome in large classes.
MATH G160	cSLO 3	2013 - 2014 (Spring 2014)	The students have achieved an acceptable rate, therefore I don't think it needs to be changed.
MATH G160	cSLO 3	2013 - 2014 (Fall 2013)	Although the majority of students earned an acceptable grade (higher than 70%) on this portion of my quiz, in the future, I will give them more time between learning the material in class and assessing their understanding of the material in a quiz. Students had 48 hours to complete the corresponding homework assignment, and 15 students did not complete it.
MATH G160	cSLO 4	2014 - 2015 (Spring 2015)	<p>Comments from Math G160 instructors include: "Since this question was a one specific type of probability problem of many that are covered in this course (note that this chapter was covered in the first half of the semester and the cSLO was assessed on the final exam), we as course coordinators may choose to alternatively select a group of several various types of probability questions to incorporate next time cSLO 4 is assessed. The majority of students appeared weakest in general in the probability portion of this course. I will be incorporating different pedagogy styles in the future, especially during this rigorous chapter, such as posting instructor-made tutorial videos, scheduling more class work time during this chapter, and assessing this material more frequently, to name a few. I am also very interested in observing my fellow colleagues' approach to covering this material. I will be observing a colleague's summer Math 160 class this summer. I feel strongly about including cSLOs on the course final exam, as these outcomes are by definition skills we desire our students to possess as they exit the course. Keeping this goal in mind, I plan to incorporate review problems throughout the course quizzes and exams. That is, I plan to include, say, a Chapter 5 problem on a quiz otherwise emphasizing Chapters 8 and 9. Students will be informed to expect this practice. "To improve student learning in this area of probability, I'll plan on more assessments such as quizzes and hand-on activities in this area. So the next time I teach Math 160 I will focus on strengthening my students' knowledge in this topic. "A review of the topic will be needed since the SLO tested a topic during the first quarter of the course." "Here are some suggestions I have for future assessment of Math 160 SLOs:</p> <ul style="list-style-type: none"> •Re-write the problems that are wordy in MyMathLab •For this SLO, there are many types of probability problems. This is only one of them. Maybe assess 3 or 4 probability problems and look at probability holistically rather than a specific type of problem. •I don't know how many instructors had as many free-response problems as I did, but in the future maybe a •guideline as to the number of these problems should be considered—not only for the minimum, but also the maximum number of "show all the work" problems. •I also suggest that instructors go through the course objectives and pinpoint the most important learning outcomes that need to be assessed, including the official course SLOs. •If the focus of Math 160 is to be "interpretation" rather than calculation, the type of SLO assessment needs to be considered for this emphasis. I also suggest assessing SLOs throughout the semester, rather than all at the end of the semester. Perhaps the ones at the end of the semester should be the most important and crucial outcomes for this course. I will include similar SLO questions on a multiple choice test and make it part of class work."
MATH G170	cSLO 1	2013 - 2014 (Spring 2014)	As a result of assessment and analysis of data, to improve learning, the following changes will be incorporated: 1) Further emphasis on the content or idea of solving trigonometric equations involving secant, cosecant, tangent, cotangent and writing the general solution for these types of equations. 2) Further emphasis for recognizing and deriving the double angle formulas. In addition, present more class work applied toward writing the general solution to represent all solutions to trigonometric equations involving these formulas.3)The instructor will include more trigonometry and quadratic equations in class work activities.4)Instructor will emphasize the importance of attending all course lectures.
MATH G170	cSLO 2	2013 - 2014 (Fall 2013)	Changes that will be made within the planning of this SLO will include collaborative problem solving during class time, a new lesson plan will be created to help solidify the foundations of

Courses Assessed and their Action Plans

Course Name	cSLO #	Semester Assessed	Action Plans
			logarithms and the concepts around bases of both logarithms and exponential functions, and smaller assessments will be created to help see any improvements of acquisition before the midterm exam.
MATH G170	cSLO 2	2013 - 2014 (Fall 2013)	With the goal of improving student learning regarding logarithmic and exponential equations, instructors will prepare class work activities with mixed problems including collaborative problem solving during class time, lesson plans will be revisited, and smaller assessments will be created to help track any improvements of acquisition before the midterm exam. The instructors plan to highlight situations in which various properties of logarithms and exponents are best applied.
MATH G170	cSLO 3	2014 - 2015 (Spring 2015)	Comments from Math G170 instructors include: <ul style="list-style-type: none"> •The textbook does not include a significant amount of problems that say “find the x-intercept” of a log/exponent function (minus functions that involve simple transformations). I must remember to include more examples in class and assign problems outside the textbook that deal with x-intercepts, even if I have to create a worksheet. •Since the major problem was translation of x-intercepts as an algebraic interpretation, I believe a stronger emphasis on the ties to geometrical and algebraic forms of the x-intercepts can be stress not only with respect to logarithmic but other functions as well. •Making in-class activity on converting between logarithmic equations and exponential equations.
MATH G170	cSLO 3	2013 - 2014 (Fall 2013)	Changes that will be made within the planning of this SLO will include collaborative problem solving during class time, a new lesson plan will be created to help solidify the foundations of logarithms and the concepts around bases of both logarithms and exponential functions, and smaller assessments will be created to help see any improvements of acquisition before the midterm exam.
MATH G170	cSLO 4	2014 - 2015 (Fall 2014)	I will put this problem (or SLO problems) at the beginning of the final exam in the future semesters. Most of students who received less than 70% didn't do problem#2 at all. I'm going to do more examples in the future class. I will try to present my lecture clearly with step by step.
MATH G180	cSLO 1	2013 - 2014 (Fall 2013)	Continue to assess this SLO. Instructor will plan for just-in-time remediation of the prerequisite skills necessary and stress the correct usage of notation for greater proficiency in the assessment of this SLO. Incorporate some study skills strategies for greater success in Calculus.
MATH G180	cSLO 2	2013 - 2014 (Spring 2014)	As a result of the analysis of the data, the instructors will endeavor to:(Comments made by instructors)One of the more glaring weaknesses in Calculus 1 students is the inability to correctly simplify derivatives found using the Chain Rule. I plan to do more classroom exercises with this type of problem. Further emphasis on the content or idea of implicit differentiation involving the chain rule and product rule. In addition, more emphasis differentiating trigonometric functions whose angles are in terms of x and y. Review and practice of differentiation rules applied to challenging problems. Review and practice algebraic simplification of challenging expressions after differentiation. Assess learning through quizzes/exams and other activities as appropriate.
MATH G180	cSLO 2	2013 - 2014 (Spring 2014)	As a result of the analysis of the data, the instructors will endeavor to:(Comments made by instructors)One of the more glaring weaknesses in Calculus 1 students is the inability to correctly simplify derivatives found using the Chain Rule. I plan to do more classroom exercises with this type of problem. Further emphasis on the content or idea of implicit differentiation involving the chain rule and product rule. In addition, more emphasis differentiating trigonometric functions whose angles are in terms of x and y. Review and practice of differentiation rules applied to challenging problems. Review and practice algebraic simplification of challenging expressions after differentiation. Assess learning through quizzes/exams and other activities as appropriate
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Courses Assessed and their Action Plans

Course Name	cSLO #	Semester Assessed	Action Plans
MATH G180	cSLO 3	2014 - 2015 (Spring 2015)	<p>practice of differentiation rules applied to challenging problems. Review and practice algebraic simplification of challenging expressions after differentiation. Assess learning through quizzes/exams and other activities as appropriate.</p> <p>Instructor Comments include the following:</p> <ul style="list-style-type: none"> •Overall, I was very surprised with the success rate of this SLO assessment. I was pleased with the students' abilities to correctly use u-substitution in integration. I did not put these in a separate portion of the exam, so based on the fact that they had no "indicators" that they should use substitution, this assessment shows that students have the ability to select u-substitution as an integration technique when appropriate. •Stress that these problems are typical problems that satisfy the given SLO of the course and show them the common mistakes that may be made. •Really stress that u-substitution is the only technique of integration learned in the course and it should be mastered before moving to the next course in the calculus sequence. •Discussions with the department faculty will continue to determine best practices and assessment of more challenging SLO problems. •The SLO was well written and due to the importance of the topic, this SLO should be tested on in the future. •I am happy with the amount of students who completed the assessment. To help the students who did NOT complete the assessment, I will emphasize the importance of the basics: simplifying, trig function values, etc. I will also dedicate one full lecture to this section of the textbook, rather than devoting half a lecture.
MATH G180	cSLO 3	2013 - 2014 (Fall 2013)	<p>Interestingly, the question that students did not perform well on, question2, was missed because students attempted to solve it using an incorrect method. I will continue to stress the importance of paying attention to when a method is producing the desired result and the necessity of trying other methods when it is not. Since I taught two Calculus 1 classes this semester and used the same questions to assess the SLOs, I can compare the results for the two classes. I used the same techniques to teach the material both classes, yet one class performed well on question 2 while the other class did not. This variability in data is due to variability in the student population, not due to differences among teachers or teaching methods.</p>
MATH G180	cSLO 4	2014 - 2015 (Fall 2014)	<p>Comments from the Instructors of the Fall 2014 Math G180 sections include:</p> <ul style="list-style-type: none"> •Students may have left the problem blank because it's the last problem on the final exam. Therefore, having SLO problems at the beginning of the final exam in the future semesters. •A greater emphasis on the importance of reading the problems before solving them may be necessary. •Applied Optimization is a very interesting topic in Calculus. Unfortunately, many students find it challenging due to the mode of delivery (word problem), the prerequisite knowledge of differentiation, and the necessity to verify claims using known tests or theorems. •Continue to use worksheets and/or group activities to familiarize students with various applied optimization problems. •Students had difficulty solving a word problem that approached the SLO from a different set of given information. This particular problem was not a difficult one to solve, but the students are struggling with critical thinking. They would rather have each problem worded the same way and solved with exactly the same steps. In-class exercises with this type of problem, worded in different ways and with different given information, will help develop the critical thinking skills. •There will be a worksheet that emphasizes key words in each type of applied problem, which will help differentiate how to solve each problem. The importance of testing critical points and endpoints will be highlighted using problems that have the extreme value at the endpoint. An optimization worksheet will be completed during class in groups using all of the correct steps listed in the rubric.
MATH G180	cSLO 4	2013 - 2014 (Fall 2013)	<p>As a result of the analysis of the data, the instructors will endeavor to:</p> <ol style="list-style-type: none"> Assess this SLO in a different manner or using different types of questions, and/or reassess on final exam since the problem was gone over completely in class. In class, have students practice labeling the unknowns of optimization problems and explain how they relate unknowns to the given clues in the problem and to functions that are to be maximized/minimized. Give more time to problem and concept development in future classes since it is clearly of difficult topic for students. Foreshadow better for the students. Let the students know how important all the

Courses Assessed and their Action Plans

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			pieces are as we go through them individually. ie.Critical points, max/min with 2nd derivative test, etc.
MATH G185	cSLO 1	2014 - 2015 (Spring 2015)	More discussions about strategies to ensure student learning of this SLO will continue. Assigning more similar problems for practice and holding algebra review sessions may have a positive impact and should be explored. The department will continue to assess this SLO again to see if students achieve higher success levels.
MATH G185	cSLO 1	2013 - 2014 (Fall 2013)	Stress the importance of understanding and memorizing the formula. Review on needed algebra skills such as simplifying and factoring expressions.
MATH G185	cSLO 2	2013 - 2014 (Spring 2014)	As a result of the analysis of the data, the Instructor #1will endeavor to : (A) Incorporate more class work time that includes Series Tests questions. One 1-hour class group work activity was completed this semester on this topic. This hour in which the students worked the problems, instead of observing the instructor lecture, appeared beneficial. More class time will be used in this way in the future. (B) Continue to stress the importance of thoroughly knowing the tests, when and how to apply them, and how to interpret their results. As a result of the analysis of the data, the Instructor #2 will endeavor to: (a) Assess the SLO multiple times next semester in different format other that the final exam. Maybe midterm or quiz. (b) Have a more in depth discussion on how to approach problems of absolute convergence when the ratio test fails. (c)Make sure students fully understand the difference between absolute and conditional convergence using more than 1 example in notes.
MATH G185	cSLO 3	2013 - 2014 (Fall 2013)	As a result of the analysis of the data, I plan to: (A) Assess this SLO again and in a different manner (quizzes, exam other than final) (B) Cover this material earlier in the semester (the new text accommodates this) (C) A class work activity was done on this topic, and will continue to be included in the schedule
MATH G185	cSLO 4	2014 - 2015 (Fall 2014)	Share effective strategies with other Math G185 instructors. Incorporate appropriate use of online applets to demonstrate challenging mathematical concepts. Incorporate in-class activities that will help students learn this concept.
MATH G235	cSLO 3	2014 - 2015 (Spring 2015)	Discussions with the department faculty will continue to determine best practices and assessment of more challenging SLO problems. Use of technology tools may be worthwhile investigating for this course.
MATH G280	cSLO 1	2013 - 2014 (Fall 2013)	Enacting “changes in teaching, standards, and/or assessment methods “has NOTHING to do with improving student learning in this course. Students are receiving excellent instruction, they have an excellent text written with great care and precision, and they have a plethora of ancillary materials for help. What they need to improve student learning should have occurred long before their “college” career: the development of a mind that has experienced the process of learning through disciplined study and communication through clear precise writing.
MATH G280	cSLO 2	2014 - 2015 (Spring 2015)	Instructor Comments include the following: •The majority of students who were unsuccessful did not attempt the problem. I believe that students would benefit from a review of all the different ways to find tangent planes to surfaces. •Spend more time discussing this application of the gradient vector.
MATH G280	cSLO 3	2014 - 2015 (Fall 2014)	Instructors’ comments regarding planned changes to improve student learning were: •Remind students to study and practice before each test. •Remind students to double check their derivatives. •Use quizzes to motivate students to study regularly. •Assign more homework so students can practice solving systems of equations.
MATH G282	cSLO 3	2013 - 2014 (Fall 2013)	Continue to assess this SLO in a variety of formats.
MATH G285	cSLO 4	2014 - 2015 (Fall 2014)	Students were able to generally apply the solution method to work through the problem but missed points for incompleteness or computational errors. Since this was given as part of the final exam, time management and test anxiety may be factors to consider for future assessments. Continue to review solution methods and assess students at appropriate times.