Basic Program Information

Department Name: Department of Mathematics

Division Name: Physical Sciences, Mathematics, and Engineering Division

Program Mission(s):

In support of the college mission, the department commits itself to providing access to outstanding educational opportunities for all of our students to study developmental and undergraduate mathematics developed rigorously in a relevant contextual environment.

More specifically, it is our mission to provide every student the opportunity to pursue an outstanding math education, through a rigorous curriculum that develops students' quantitative skills and prepares them for success in courses at 2-year and 4-year institutions. We pledge to provide students with opportunities to become effective problem solvers and to use mathematics in a contextual and relevant environment. Through our pre-collegiate math program, we prepare students for the college-level opportunities that they are pursuing. Through both our transfer program and our pre-collegiate program, we strive to develop within our students an appreciation for the respected traditions of classical mathematical thought: rigorous thinking, reason, inquiry and beauty.

Please list all Program Review team members who participated in this Program Review:

Name	Department	Position
Jeffrey Anderson	Mathematics	Faculty
Zachary Cembellin	Mathematics	Faculty
Marnie Francisco	Mathematics	Faculty
Nicole Gray	Mathematics	Faculty
Marc Knobel	Mathematics	Faculty
Phuong Lam	Mathematics	Faculty
Debbie Lee	Mathematics	Faculty
Rick Martinez	Mathematics	Faculty
Patrick Morriss	Mathematics	Faculty
Rachel Mudge	Mathematics	Faculty
Sarah Munoz	Mathematics	Faculty
Young Hee Park Lee	Mathematics	Faculty
Kathy Perino	Mathematics	Faculty
John Sawka	Mathematics	Faculty
Lori Silverman	Mathematics	Faculty
Jennifer Sinclair	Mathematics	Faculty

Brian Stanley	Mathematics	Faculty
Sarah Williams	Mathematics	Faculty
Teresa Zwack	Mathematics	Faculty

Please include the following information about your program:

Total number of Full-Time Faculty:	19
Total number of Part-Time Faculty:	29
Total number of Classified Professionals:	0

Please list all existing Classified positions:
None

List all Programs* covered by this review & check the appropriate column for program type:

Program Name	**Certificate of Achievement Program**	**Associate Degree Program**	**Pathway Program**
Degree Program		✓	
Transfer Program **Culminating class: Math 10, 44 or 57** **Culminating class: Math 1C** **Culminating class: Math 12**			✓
Pre-collegiate Program **Math 230/235 (MathMyWay)** **Culminating class: Math 105/Math108**			✓

*If you have a supporting program or pathway in your area for which you will be making resource requests, please analyze it within this program review (i.e. Integrated Reading and Writing, Math My Way, etc.) You will only need to address those data elements that apply.

Section 1: Data and Trend Analysis

Please complete the appropriate data elements.

A) Instructional Program Data:

Data will be posted on http://foothill.edu/staff/irs/programplans/programreviewdata.php
You must manually copy data in the boxes below for every degree or certificate of achievement covered by this program review.

Certificate and Degree Programs	2011-2012	2012-2013	2013-2014	% Change
AS Math	3	7	4	– 43%

	2011-2012	2012-2013	2013-2014	% Change
Enrollment	10147	9538	10030	5.2%
Productivity (College Goal 2014-15: 535)	544	512	521	1.7%

B) Student Services Programs Data

Please enter the number of students served over the last 3 years.

	2011-2012	2012-2013	2013-2014	% Change
Students Served	N/A	N/A	N/A	N/A

This data was obtained via the following sources (circle): CCC Apply, Ask Foothill, Credentials, SARS, Other (List)_____

C) Administrative Unit Data

Please enter the information below.

Dimension	2011-2012	2012-2013	2013-2014
Students Served (Unduplicated)	5362	5584	5561
Faculty Served	N/A	N/A	N/A
Staff Served	N/A	N/A	N/A
Full-time FTEF	13.9	14.2	16.8
Part-time FTEF	12.2	15.3	13.5
Full-time Staff	N/A	N/A	N/A
Part-time Staff	N/A	N/A	N/A

Using the data entered for your program above, briefly comment (1-3 paragraphs) on changes in students or staff served, enrollment and/or productivity for your program in the last year.

What changes have been made or are planned as a result of your analysis of the data? (for example, new curriculum, new pre-requisites, a focus on student retention, changes in teaching approaches informed by SLO Assessments, changes in when classes are scheduled, better use of technology, etc.)

Overall enrollment and productivity:
Enrollment is up by 5.2% and productivity is up by 1.7% (only missing the college goal by 14). While we experienced a slight decrease 2 years ago, we have increased back to the enrollment of 3 years ago. We have higher enrollment with fewer unduplicated students. This means more students are taking multiple courses per year, which has translated to fewer unduplicated students served.

Course enrollment trends show Math 105 enrollment decreased by 6%, while Math 220 enrollment increased by 36%. One possible reason for this trend is that more students are placing into Math 220, rather than 105. Significant drops in some courses (such as Math 10 and Math 105) might be attributed to the decrease in marketing by the school overall. The increase in the calculus sequence might be attributed to higher international student enrollment.

Focus on student retention:
Based on research in non-cognitive factors, faculty have implemented interventions in their classrooms to increase retention of high risk students. Such interventions include changing of a fixed mindset and email routines for non-participating students.

Teaching approaches and use of technology:

- Focus on concept quizzes
- Flipping the classroom
- Video tutorials and other support for online and traditional classes
- Began development of a hybrid Introductory Algebra
- Continue to develop components of existing hybrid and online math courses
- Offer Math 1A, 1B, calculus, online
- Continue to offer courses in both hybrid and online delivery formats.
- Use of open source content and textbooks
- Adding common no-stake or low-stakes assessments across multiple sections.
- Course specific sub-groups continue to meet and discuss pedagogical practices.

Note: FA, PDL, Pass the Torch, and grant release time accounts for the discrepancy between FTEF (16.8) and full time teaching faculty (19).

Section 2: Student Equity

The college is committed to student equity, defined by the Student Equity Workgroup as fostering similar outcomes for all students. One targeted area for improvement in this year's Student Equity plan is to increase the course completion rates for African American, Latino, and Pacific Islander students over the next three years by 3 percentage points.

Please describe how you see members of your program contributing to this goal.

During Spring quarter 2014, the PSME division created "The Foundations Lab." This is a special room near the PSME center dedicated to Prealgebra and Algebra students. The creation of this space should make it easier for Algebra students to get consistent help and this should also help the students from these under-represented groups who are enrolled in these developmental courses.

Through the NSF grant, the math department has worked closely with Ben Stefonik to conduct a research project on student mindset. Ben, with input from the department, created an activity/assignment for all students enrolled in the first two quarters of Precalculus (Math 48A & 48B). The activity is designed to help students develop a growth mindset toward studying mathematics. That is, instead of seeing their math ability as a fixed trait assigned at birth by their genetics, they think of math ability as a trait that can be enhanced through work and effort, much the same way that muscle strength is increased by lifting weights. Similar activities have been shown at other colleges to improve student success and the math department is hopeful that this activity will be shown to positively impact all of our students, but especially those from under-represented groups. The research project was implemented as a double blind study in Math 48A and 48B classes in Fall 2014, and we will continue to work with Ben Stefonik, to revise and improve the implementation. All students in Math 1A classes in the Fall 2014 quarter were given the opportunity to participate in the mindset activity with permission from their instructors.

William Walker, a student services specialist, has been assigned to the PSME division to help with outreach and early alert for PSME students. We can help increase the success of African American, Latino, and Pacific Islander students by having William work closely with faculty in linking these students to the Pass the Torch Program, the PSME center and other services available on campus.

The department continues to work on better ways to advertise the alternative Statway pathway for students taking Algebra. Instead of taking Math 220, Math 105 and Math 10 students can take Math 217 and Math 57. The latter courses make up Statway and have been shown by the Carnegie Foundation, in classrooms and colleges across the country, to be courses in which targeted student groups are more successful than the traditional algebra pathway.

Please review the equity data available to you on the students served in your program and their outcomes by ethnicity (including, for instructional programs, course success rates by ethnicity). If differences exist, what efforts have members of your program undertaken or discussed to address them? If your program has undertaken any initiatives or interventions as a result of these efforts or discussions, please share what you have learned as a result of these initiatives.

The overall course completion (defined as course success) rate for the mathematics department held steady at 60%, while the completion rate for targeted groups decreased from 51% to 48% and increased slightly from 64% to 65% for non-targeted groups. So, while we are consistently meeting the overall course completion standard (55%), we are not meeting the course completion standard for targeted groups and the completion rates for these groups slipped some during the 2013-14 academic year as compared to the 2012-2013 year. Specifically, our completion rates for African Americans decreased from 46% to 43% and Latinos from 50% to 47% while the completion rate for Pacific Islanders held steady at 48%.

When we consider the course completion rates for transfer level mathematics courses we find that all (15 out of 15) of those courses have completion rates that exceed the institutional standard with a range of success rates for those courses being (58% - 82%). During the 2013-14 year we were able to increase the completion rates for Math 48A to 55% and Math 48B to 58% so that they now meet the course completion standard. The success rates for both these courses had been 53%. Largely this change may have been due to selecting better course materials.

When we consider the course completion rates for developmental mathematics courses we find that just half (3 out of 6) of those courses have completion rates that exceed the institutional standard with a range of success rates for those courses being (46% - 76%). There was quite a bit of fluctuation for the success rates in the developmental classes. The completion rate for Math 105 changed from 51% - 55% and now just meets the institutional standard. However, while the success rate for Math 230 increased from 41% - 46% it still does not meet the institutional standard. On the other hand, the success rate for Math 220 decreased from 58% - 53% and that course no longer meets the institutional standard, while the success rates for Math 108 and Math 217 fell considerably from 75% to 46% and 79% to 46% respectively.

Math 108 and Math 217 are both courses with only a small number of sections (1 per quarter) offered per year. The department needs to work with counseling and placement testing to make sure that students are appropriately advised about Math 108 and that faculty teaching Math 108 and Math 217 are properly supported.

The success rates for Math 220 and Math 105 may have been affected by the materials change and course format change for Math 220. The Math 220 course changed to meeting only 5 hours per week in 2013-2014 instead of 7 hours per week in 2012-2013. This may be responsible for the dip in the success rates for this course. Along with the contact hour change we also switched to a book that could be used for the 2 quarter sequence. It is possible that the consistency of the course materials made the transition from Math 220 to Math 105 smoother and resulted in the higher success rates for Math 105.

The faculty teaching Math 230 and Math 235 continue to work on ways to support student success in those courses while still ensuring that students have the background that they need to be successful when they move on to math 220.

The fact that the success rates for developmental classes do not routinely meet the institutional course completion standard is a major equity issue. It is still the case that a higher proportion of these classes are taught by part-time faculty. That means that students have limited access to their instructors outside of class, and instructors have limited access to informal and formal professional development activities. The creation of "The Foundations Lab" will help with student access to reliable help. However, the department needs resources to better support part-time faculty especially those teaching developmental courses.

While it is evident that a large portion of the courses taken by students in targeted groups are our pre-collegiate courses, the department would benefit from data reporting the relative numbers of target group students in our pre-collegiate level courses versus our transfer level courses to help us better asses the issue related to equity and success within our courses.

Several members of the department have sought to foster a culture of professional growth in the developmental classes by participating in mentorship pairs between new instructors and experienced faculty who have developed programs with high success rates. Additional resources to allow the department to expand mentoring activities to more instructors of pre-collegiate classes would represent a significant investment toward our equity goals.

Section 3: Outcomes Assessment Summary

A) Attach 2013-2014 Course-Level (for Instructional Programs Only) – Four Column Report for CL-SLO Assessment from TracDat, please contact the Office of Instruction to assist you with this step if needed.

The report is 33 pages long, and is included in a separate document emailed with this file.

B) Attach 2013-2014 Program Level – (for all programs) Four Column Report for PL-SLO Assessment from TracDat, please contact the Office of Instruction to assist you with this step if needed.

The report is 3 pages long, and is included in a separate document emailed with this file.

Section 4: Assessment and Reflection

Based on your assessment data and reflections, please respond to the following prompts.

A) <u>For instructional programs only</u>, what curricular, pedagogical or other changes have you made as a result of your course level student learning outcomes (CL-SLO) assessments?

1. <u>STEM Day</u> – As part of a first division-wide STEM Day at Foothill College, some math instructors volunteered their time before the quarter started for a meet and greet with their incoming Fall 2014 students. Students were sent emails notifications ahead of time welcoming them to attend the STEM Day. Math instructors had an opportunity to meet with some of their students who attended the event in a PSEC classroom. This was in hope of getting students to feel more comfortable with their instructors at the start of the academic year and to let students know what they needed to be prepared for the upcoming quarter.
2. Instructors have moved away from experimenting with common final exams. The common final exams only seemed to add stress to the already present anxiety that students have during mathematics finals.
3. Some instructors are experimenting with some *MindSet* activities in their classrooms. These activities are based mostly on research about physiological aspects of the brain and aim to inform students about this. The goal is to get students more educated about how math can be learned through successful struggle.
4. The *Foundations Lab* was set up in the 4200 building. Its goal is aimed at tutoring for students in pre-collegiate math courses. The hope is that students will feel more comfortable here rather than being intimidated by the larger scale of the PSME Center. The supplemental instructors working in the lab specialize in working with this population. In addition, supplemental instructors in the Foundations Lab, along with Eric Reed, are working with DRC staff to better serve these students via professional development and pedagogical exchanges.
5. Math 1A and MATH 1B were offered online as an attempt to increase accessibility, with success rates of 36% and 33%, respectively. To support these online courses, faculty created video lectures. These lectures were also used in in-person classes to implement a flipped classroom approach to instruction and/or supplemental support
6. Some instructors are using test corrections as part of their courses. For some of these classes the test corrections are done by appointment only through the PSME Center. Students must get their corrections signed off by one of the PSME Center's supplemental instructors before getting credit. In these cases, the supplemental instructors working there are provided with the solutions key to the tests and during the appointment, the supplemental instructors challenge students to orally explain their reasoning before approving test corrections. In other courses, the individual instructor handles the verification of corrections. There is concern among some instructors about the students who cannot make the time in their schedules to get an appointment at the PSME Center for corrections.

B) <u>For instructional programs only</u>, how has assessment of program-level student learning outcomes led to certificate/degree program improvements? Have you made any changes to your program based on the findings?

Many of the course-level SLO's have some component in asking students to construct mathematical models of problem situations, interpret their mathematical results and communicate mathematical ideas through graphs, tables, equations and verbal descriptions to support the program-level SLO's.

Most courses support the college mission since courses beginning from Math 10 and Math 48A/B/C are UC and CSU transferable.

Math 230/235 and M220 serve our basic skills students and Math 105 is applicable to an AA/AS degree and prepares our students to take college level courses.
Basic skills courses also provide prerequisite skills necessary for work force programs.

<u>For all programs: Instructional, Students Services, Administrative</u>

C) **How do the objectives and outcomes in your area relate to the program-level student learning outcomes and to the college mission?**

Mission Statement: Foothill College offers educational excellence to diverse students seeking transfer, career preparation and enhancement, and basic skills mastery. We are committed to innovation, ongoing improvement, accessibility and serving our community.

In the 2013-2014 academic year, there were zero ADTs awarded in mathematics.
In the 2013-2014 academic year, there were four AS degrees awarded in mathematics.
The majority of our classes are service classes (i.e., we aren't really a program; our courses serve as prerequisites for classes in other departments), so there has been more dialogue on improving the success in individual courses rather than in the program aggregate.

D) What do members of your program do to ensure that meaningful dialogue takes place in both shaping and evaluating/assessing your program's student learning outcomes?

The math department is very large with a wide range of classes. Because of this, we have set up a system where individual instructors "own" certain courses. That means they are responsible for setting up the SLO process (among other things) for their "owned" courses. From there, instructors design SLO questions and then have the instructor for each course section implement the assessment in their course, unless an instructor chooses otherwise to use their own. When results are in, the instructors teaching those courses exchange their results, reflect upon them and discuss any resource needs for the future.

Indicated from the SLO reports, faculty would like more time in discussing the SLOs in person. In particular, there is a want for a more meaningful discussion about the SLOs assessment that includes the part-time faculty members.

For some courses, such as MATH 1A and MATH 1B instructors met weekly and discussed any ideas they have, including which types of questions are relevant for the SLO process.

Section 5: Program Goals

Please comment on progress you have made on program goals from prior program reviews.
Check the appropriate status box & provide explanation in the comment box.

Goal/Outcome (This is NOT a resource request)	Related to prior resource request (Y/N)	Status: Completed, In progress or Revised	Comment on Status
1. Provide much needed support and guidance for our adjuncts.	Y	In progress	A committee met and designed a model of what mentoring might look like without reassign time. This model is currently unfunded.
2. Improve teaching consistency among instructors.	Y	In progress	Math My Way instructors continue to meet weekly to align instruction. Math 1A and Math 1B instructors met weekly last year to align instruction and develop interventions. Math 1A instructors continue to meet weekly. Last year, we had 3 occasions of "team teaching," in which two instructors held their respective sections of a course simultaneously in the same large classroom.
3. Develop and disseminate course by course collection of teaching resources.	Y	In progress	This continues through the continued use of DropBox and MyGroups and GoogleDocs. None of these are ideal. Maintenance is an issue. The part-time mentoring committee included maintenance of such collections as part of its model, which is currently unfunded. In the Math 1A, 1B arena, faculty have created or collected videos, objectives sheets, activities, and other shared resources.

4. Develop the means to track students across courses.	Y	In progress	The department continues to work on this goal. The PIs for the NSF grant tried to develop tracking via Blackboard & Etudes, with limited success. They have also tried using manual data collected by IR, but it can only be compiled at the end of a quarter and cannot provide real-time data to inform decision about student progress during the quarter.
5. Develop and nurture an ongoing conversation about pedagogy.	Y	In progress	Last year, we held an off-site retreat. This year, some faculty are participating in a weekly brown-bag get together during college hour to share 4T's: Tips, Tricks, Toys, and Theorems.
6. Develop the PSME Center into a faculty resource to support student success.	N	Revised	Revised, because the PSME Center is its own "program." The PSME Center has extended its office hours to include evenings and weekends. Several faculty are using the center to check test corrections to help students learn from their mistakes and earn back a percentage of points lost during an exam. The Foundations Lab, an extension of the PSME Center, opened this Fall and is operating under full capacity to tutor basic skills and algebra students.
7. Enhance outreach to students to increase retention and success.	N	In progress	We held our first STEM Day to welcome students and establish a rapport. Anecdotally, faculty report a stronger than average rapport with students who they met that day. Additionally, many students took advantage of the opportunity to verify/discuss the appropriateness of their placement. William Walker, Counseling Services Specialist, started the Early Alert pilot program for students in PSME division this Fall and reached out to students referred by PSME faculty.

8. Respond effectively to the changing needs of students.	N	In progress	We have developed and offered online classes to provide access to those for whom classroom attendance is a barrier to education. The PSME Center is offering evening and weekend hours. We are offering more activities focused on metacognition. We are supporting students with development of study skills. We have worked with Ben Stefonik to create a mindset intervention (measured before and after using a survey). Math 1A instructors continue to meet weekly. We have worked with William Walker to target students who are struggling (will measure with course grades and check on whether they used services on campus). We have held review sessions to prepare for students for finals. Some instructors are incorporating common low stakes or no stakes assessments. Some instructors are using exam "wrappers" (before/after reflections and activities) to help students prepare and analyze their study habits.
9. Build STEM career information resources in the PSME Center.	N	Revised	Revised, because the PSME Center is its own "program." Engineering Instructor, Sarah Parikh, sends out regular Foothill STEM News to students and staff, organizes weekly Engineering talks as well as Leadership Lunches for interested STEM students.
10. Make videos and handouts to support flipped classroom implementation.	Y	In progress	Many videos and activities have now been created to support Math 1A and Math 1B.
11. Acquire equipment to facilitate faculty producing video to support in-class, flipped classes and online classes.	Y	In progress	We are working with the Fine Art division to build a recording studio with Measure C money. Equipment has been ordered but we are waiting for delivery and testing when they do arrive.

Please list any new goals for your program you would like to undertake this year. The goals should be linked to the college mission and be driven by data (including student and program learning outcomes reflections).

Goal/Outcome (This is NOT a resource request)	How will this goal improve student success or respond to other key college initiatives?	How will progress toward this goal be measured?
1. Increase student success rates in targeted basic skills courses: Math 230/235 (46%) and Math 220 (53%)	The goal is increased student success to meet the institutional standard.	Annual data on success rates.
2. Form a mentor pool and assign each part-time faculty a mentor.	We are hopeful that pedagogical discussions will result in better instruction and assessment, and subsequently increased student success.	Milestones: 1. Formation of pool. 2. Assignment of part-time faculty to full-time mentor. 3. Log of interactions will inform further developments
3. Increase success rates of targeted groups in Math 220 and Math 48A	By increasing the success rate of targeted groups, we will increase the overall success rates. Also, this will address the Equity issue that is a primary initiative this year. Since the department is large with a variety of courses we will start our efforts with two courses, a developmental course and a transfer level course.	Milestones (measured in these selected courses): 1. Formation of a team of full time faculty who will work together on this issue. 2. Development of a "Plan" by spring 2015, including data collection by IR. 3. Implementation of plan starts S2015 or F2015. e.g.: a. Mindset Intervention b. Early assessment to inform early alert. c. Student participation with Early Alert. 4. Monitor Progress in the 2015-2016 Academic year with recommendations at the end of that year for spreading successful ideas.
4. Increase student success rates and enrollment by resident (and target population) students in Math 1A, 1B.	The goal is increased student success and increased enrollment.	Milestones: • STEM Day • Mindset interventions • Weekly collaboration/discussion • Early Alert with William Walker, measure course grades and services accessed. • Pedagogical/assessment shifts:

		○ No/low stake assessments. ○ Exam Corrections/Wrappers Success Rates

5. Rewrite SLO's to align with Common Core--Conceptual Understanding, Procedural Fluency, Applications –and develop appropriate assessments	This will continue our progress towards meaningful assessment and program improvement; it is our hope that it will guide us towards improved student success.	Milestones: • Wordsmith 3 SLO's • Develop assessment plan & timeline (probably 1 key SLO per year, across all classes as a department) • Enter SLO's in TracDat; Deactivate old SLO's. • Year 1: SLO #1 – Assess, Reflect, and Follow up. • Year 2: SLO #2 – Assess, Reflect, and Follow up. • Year 3: SLO #3 – Assess, Reflect, and Follow up.

Section 6: Program Resources and Support

To be completed only if making a new resource request.

Using the tables below, summarize your program's unfunded resource requests. Refer to the Operations Planning Committee website: http://foothill.edu/president/operations.php for current guiding principles, rubrics and resource allocation information.

Full Time Faculty and/or Staff Positions

Position	Related Goal from Table in section 5 and how this resource request supports this goal.	Was position previously approved in last 3 years? (y/n)
None		

Unbudgeted Reassigned Time (calculate by % reassign time x salary/benefits of FT)
Indicate duties covered by requested reassign time:

Responsibility	Related Goal from Table in section 5 and how this resource request supports this goal.	% Time
None		

One Time B Budget Augmentation

Description	$ Amount	Related Goal from Table in section 5 and how this resource request supports this goal.
Math My Way TAs	$30K p/year	1, 3: Enables instructor to maintain a student-centered learning environment.
Let's Play Math Funding	$2K p/ year	4: Provides outreach and contributes to a sense of belonging for local youth. Provides advanced math students opportunity to volunteer to the field of Mathematics and within our community. This will hopefully lead to more students pursuing STEM degrees at Foothill.

Scanners for Math 220, 48A	$30K p/year	1, 3, 5: Prompt, targeted feedback positively impacts our students' capacity to learn and succeed in our courses. We chose online homework systems to provide specific targeted feedback for a narrow range of online problems. However, we are adamant that students need prompt feedback on written assignments. This feedback helps students develop strong mathematical thinking skills. Such guidance is necessary to help students prepare for in-class, paper-and-pencil exams used throughout our department. Scanners will provide an initial review of students' work. This will bolster our capacity to administer feedback by encouraging students to follow standard math formatting conventions, strong mathematical writing techniques and by checking for completeness. In turn, we will be able to spend more time developing meaningful targeted feedback and addressing weaknesses.

Ongoing B Budget Augmentation

Description	$ Amount	Related Goal from Table in section 5 and how this resource request supports this goal.
Materials Coordinator	$6K p/ year	2: Improves part-time faculty access to information and has direct impact on improving part-time teaching.
Embedded Tutors from PSME Center in Math Classes	$20K p/ year	1, 3: Allows us to integrate services from PSME with our teaching load. Helps us train new PSME instructors and coordinate our efforts to improve retention and success in Math class.

Facilities and Equipment

Facilities/Equipment Description	$ Amount	Related Goal from Table in section 5 and how this resource request supports this goal.
Software (Mathematica, MATLAB, MathType, TI-Emulator Site licenses, PollEverywhere, and Nearpod or Zaption)	$10K p/ year	4: Mathematical software improves our students' capacity to conceptualize mathematical techniques, calculate mathematical quantities and produce professional mathematical writing. Using this software, we will assign applied projects and mathematical writing exercises with confidence that all of our students will have access to the resources necessary to complete these assignments while on campus. Presentation software such as PollEverywhere can provide instructors with quick feedback of student's understanding of classroom engagement. Video delivery content sites like Nearpod or Zaption can change watching video from a passive to an active learning activity.
Additional Tablets (Samsung, iPad) for instructor class-time use.	$15K p/ year	1, 3: More instructors would like access to use these tools in their teaching. Tablets can help instructors to create a more dynamic lecture and learning environment, from software demonstrations to color-coded lectures that can be made available to both instructors and students. Student work can be quickly and anonymously projected onto a large screen for classroom discussion and learning.

Section 7: Program Review Summary

Address the concerns or recommendations that were made in prior program review cycles, including any feedback from Dean/VP, Program Review Committee, etc.

Recommendation	Comments
1. Have an orientation for freshman STEM students	This fall STEM day brought students and instructors together before the start of classes. Students got to know each other and their instructors in a relaxed, fun setting. They received information about their Fall classes, the different class sequences, and the degrees and programs offered in STEM.
2. Improved method of placing new Foothill students into the proper math class	We have not done anything new in the past year to improve placement. For the sake of researching how placement is working, the department agreed with the Office of Instruction to hold cut-off scores steady for the next 3 years or so. However, the Summer Bridge Program continues to serve students placed in Basic Skills classes by giving them an opportunity to brush up on their skills and retake the placement test. The department agrees that the proper placement of students is an issue. A system of placement that includes multiple measures should be considered.
3. The PSME division needs a dedicated counselor to address the needs of our students.	The PSME division has recently been assigned two adjunct counselors who are dedicated to helping students enrolled in courses in the PSME division. This is a great benefit for our students. The department is excited and hopeful that this will increase student success. Additionally the division has been assigned a Counseling Services Specialist. This has allowed the division to reestablish the Early Alert system and has reached many students already. The Early Alert system will be getting more resources Winter quarter so that it can reach more students and serve the already large number of students that were referred.

4. Math department should reflect on and support the changes being made in the department.	On the agenda for the first department meeting in Winter quarter is a review of Math 108 and online Math 1A and 1B. These are relatively new offerings and we will look at what's working and what's not and how we can make improvements. The department knows that such review and support is necessary and wants to do more in that area in the future. However we still continue to struggle to find time for theses discussions as completing SLOs and Program review demands a lot of the department meeting time.
5. Address low success rates	Over the past two years, the department has focused on improving the success rates in Math 1A and Math 1B as part of the NSF grant. The success rates in these courses have increased. We will continue to work on these classes. The success rates in Math 48A and 48B have also increased. This may be the result of a change in the course materials. These success rates are still low though and we hope to improve them. During the creation of the program review for the 2014 -2015 school year, Math 220 and Math 48A were selected as the classes that we will focus on increasing the success rates in next. We can implement some of what we have used for Math 1A and 1B as well as develop new strategies appropriate for these levels. If our efforts in these classes are successful, we will expand and use similar methods in other classes.
6. Provide support to part time faculty	As new part time faculty are hired, they will be paired with a fulltime faculty member who regularly teaches the classes they have been assigned. The fulltime faculty member can provide support related to the class and the workings of Foothill College in general. The department is concerned that this system is not sufficient to give the part time faculty all the support they need and will only be successful with some additional coordination. The department is large and the majority of the classes taught by part time faculty are Math 48C and below; these are the classes for which we have the greatest concerns about student success and equity.

7. MOOC's and online mathematics classes offered by Foothill.	Many of the faculty members are committed to improving the quality and quantity of online mathematics classes. Online Math 1A and 1B have been introduced and online Math 105 continues to be scheduled. The success rates in Math 105 have shown some improvement. We expect that the Online Educational Initiative will greatly shape our online classes in the future.
8. Outreach to domestic STEM transfer students	The department would be overjoyed to have more domestic STEM transfer students, but the faculty are not the in the best position to recruit them. We would be happy to see the outreach team increase its efforts to recruit STEM students and we would be happy to support their efforts.

a. After reviewing the data, what would you like to highlight about your program?

The department is happy that overall we meet the institutional standard for course completion rates for Math Courses. However, we recognize that not all groups succeed at the same rates in our courses. In particular students from targeted groups have much lower success rates. Anecdotally we "know" that these students are disproportionally represented in our lower level classes. So, we'd like to have our improvement efforts focus on those courses. However, it would be nice if we could get success rates for target groups for all our classes. So, that we can make sure that we are meeting the needs of those students across all levels of the curriculum.

Section 8: Deans Feedback and Follow Up

This section is for the Dean to provide feedback.

A) Strengths and successes of the program as evidenced by the data and analysis:

The Math Department faculty has a strong commitment to student success and consistently searches for new ways to enhance instruction. For a department this large, the faculty is extremely organized, collegial and communicates well with one another. Highlights of their efforts (and results) to advance equity and student success include the following:

1. Sustaining continuous growth in enrollment and productivity while meeting success rate metrics for the College.
2. Meeting frequently to address issues facing the department such as adjunct faculty support and mentoring, online course success rates, basic skills curriculum, and SLOs.
3. Implementing and experimenting with new pedagogy to increase student engagement, enthusiasm and success rates such as *MindSet* activities.
4. Participating and organizing outreach events such as "Let's Play Math", STEM Day, and hosting the American Mathematics Association.
5. Supporting the PSME Center, the new Foundations Lab, the new Early Alert Program, and other resources on campus.
6. Holding an annual faculty retreat to discuss teaching and other department issues affecting student success.
7. Incorporation of technology into the classroom such as tablets, flipped classroom videos, digital textbooks, and customized software.

B) Areas of concern, if any:

The Math Department has done an excellent job addressing areas of concern in past Program Reviews. The following are additional areas for improvement:

1. The lack of funding for coordinators to help support the large army of adjunct faculty teaching math courses.
2. The lower success rates of online Math 1A and 1B courses.
3. The lower success rates of online Math 105 sections.
4. The placement exam (ACCUPLACER) as a primary metric for placement in the math sequence.
5. Interest from the Counseling Division, Middlefield/Ed Center and students to develop an alternative pre-algebra sequence to provide an additional pathway for re-entry students.
6. Finding additional time to discuss SLOs and reflect on teaching and student success in courses.

C) Recommendations for improvement:

The following are possible solutions to the areas of concern mentioned above:

1. Provide additional B-Budget funding for efforts to support adjunct faculty with mentoring and professional development; or if funding is not identified, forming a mentoring pool is one viable short-term option, as suggested.
2. Encourage online 1A and 1B students to utilize the PSME Center to get extra assistance as well as coordinate with Early Alert efforts. Also online tutoring is a viable option for those with limited schedule availability. As videos and other teaching pedagogy are incorporated or modified, track success rates on a quarterly basis.
3. Encourage online Math 105 students to utilize the Foundations Lab in order to get extra assistance, especially with basic math principles, and coordinate with Early Alert efforts. Online tutoring is an option for students with limited schedule availability. As videos and other teaching pedagogy are incorporated or modified, track success rates on a quarterly basis.
4. Work with the new College subcommittee on placement exams as they analyze multiple metric assessments. Additionally, the Math Department should meet quarterly with the Counseling Division to inform them of curriculum changes and that placement in certain classes has caveats. One example being Math 108, which is accelerated and should only allow placement of strong, motivated students.
5. To meet demand for pre-algebra classes, Math My Way faculty (Math 235/230) should discuss if the same model is portable to the evenings or Middlefield campus; if not, the math department can discuss possible new courses that employ another successful model used at other institutions. Since pre-algebra is necessary for re-entry students (which is composed of a large proportion of targeted student groups), limiting its availability is an equity issue.
6. Organizing (and funding) professional development days or an off-campus retreat each quarter to facilitate faculty discussion. Days will be strategically selected to minimize the impact on classes with set goals and implementation timeline.

D) Recommended next steps:

__X_ Proceed as planned on program review schedule
___ Comprehensive Program Review (Out of cycle) Recommended
___ Remediation Plan Recommended

Upon completion of section 8, the Program Review should be returned to department faculty and staff for review, and then submitted to the Office of Instruction and Institutional Research for public posting. See timeline on Program Review Cover Sheet.

Unit Course Assessment Report - Four Column

Foothill College

Department - Mathematics (MATH)

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Mathematics (MATH) - MATH 10 - ELEMENTARY STATISTICS - Summarize - The student will be able to describe and summarize data effectively. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Students are given a question related to the particular learning objective. See Related Documents for a list of the questions. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% of students will get the question correct.	06/27/2014 - 71% of students correctly answered problem two on the related document **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **GE/IL-SLO Reflection:** The students appeared to be able to correctly interpret a histogram graph. That is, the ability to summarizing data graphically appears to have been mastered by the students. **Related Documents:** math 10 slo questions	06/27/2014 - The students appeared to be able to correctly interpret a histogram graph. That is, the ability to summarizing data graphically appears to have been mastered by the students.
Department - Mathematics (MATH) - MATH 10 - ELEMENTARY STATISTICS - Probability - The student will be able to determine the likelihood of events. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Students are given a question related to the particular learning objective. See Related Documents for a list of the questions. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% of the students will get the question correct.	06/27/2014 - 72% of students answered problem four correctly on the related document **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **GE/IL-SLO Reflection:** More than 70% of the students were able to answer a basic probability questions related to the experiment of rolling 2 dice and recording the sum. **Related Documents:** math10_SLO_Sp2014	06/27/2014 - More than 70% of the students were able to answer a basic probability questions related to the experiment of rolling 2 dice and recording the sum.
Department - Mathematics (MATH) - MATH 10 - ELEMENTARY STATISTICS - Inferences/Predictions - The student will be able to make accurate inferences or predictions about	**Assessment Method:** Students are given a question related to the particular learning objective. See Related Documents for a list of the questions. **Assessment Method Type:**	06/27/2014 - 70% of the students correctly answered problem three on the related document **Result:** Target Met **Year This Assessment Occurred:**	06/27/2014 - When told a data set was skewed right, 70% of the students understood that the mean for that data set would be greater than the median. Target met

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
groups of interest using limited information. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	Exam - Course Test/Quiz **Target for Success:** 70% of the students will get the question correct.	2013-2014 **GE/IL-SLO Reflection:** When told a data set was skewed right, 70% of the students understood that the mean for that data set would be greater than the median. Target met. **Related Documents:** math10_SLO_Sp2014	
Department - Mathematics (MATH) - MATH 105 - INTERMEDIATE ALGEBRA - Graphs of Functions - Identify and describe the basic shape of the graph of the following functions: absolute value, rational, radical, quadratic, cubic, exponential, and logarithmic (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Online assessment using Coursecompass from Pearson given to all sections: Recognize the graph of a polynomial function from the degree of the polynomial. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of students who took the assessment will answer correctly		
	Assessment Method: multiple choice question **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% answer correctly		
	Assessment Method: A multiple choice question on the final exam was used to assess this SLO. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% answered correctly.	06/27/2014 - 41% of the students were able to correctly match 5 or more function types (linear, quadratic, square root, logarithmic, exponential growth, exponential decay, and absolute value) with a typical graph of that type given 12 graphs (5 distractors). The book does not lend itself well to developing graphical intuition, and the graphing calculators are too complicated for students to adjust to given that apps are so prevalent. **Result:** Target Not Met **Year This Assessment Occurred:**	11/23/2014 - Request updated scantron machine that is capable of tracking student responses, including a detailed item analysis for each question, so that faculty can better assess student gaps in knowledge through quick classroom assessment.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		2013-2014 **Resource Request:** Updated scantron machine that is capable of tracking student responses, including a detailed item analysis for each question, so that faculty can better assess student gaps in knowledge through quick classroom assessment. **GE/IL-SLO Reflection:** Requires decision making and analytical skills, as well as mathematical reasoning.	
Department - Mathematics (MATH) - MATH 105 - INTERMEDIATE ALGEBRA - Solving Equations - Solve algebraically, graphically, or numerically the following: linear inequalities and absolute value, rational, radical, polynomial, exponential, and logarithmic equations (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Online assessment using Coursecompass from Pearson given to all sections: Solve equations that contain radical expressions. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of students who took the assessment will answer correctly		
	Assessment Method: multiple choice question **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% answer correctly		
	Assessment Method: A multiple choice question on the final exam was used to assess this SLO. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70 % answered correctly.	06/27/2014 - 16% of the students were able to solve the equation correctly. In retrospect this was a very difficult question. A logarithmic equation that resolved to a rational equation that involved a quadratic. Quite elegant mathematically because it involves most of the solving techniques discussed in the course, but for students it was extremely difficult. We can not conclude much from this result. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014	12/01/2014 - Work with colleagues to develop better assessment questions (and possibly better SLO's).

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		Resource Request: PD Workshop with outside experts on assessment.	
Department - Mathematics (MATH) - MATH 105 - INTERMEDIATE ALGEBRA - Simplifying Expressions - Simplify the following expressions: rational, radical, polynomial, exponential, and logarithmic (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Online assessment using Coursecompass from Pearson given to all sections: Use rational exponents to simplify radical expressions. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of students who took the assessment will answer correctly		
	Assessment Method: multiple choice question **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% answer correctly		
	Assessment Method: A multiple choice question on the final exam was used to assess this SLO. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% answered correctly	06/27/2014 - 47% of the students were able to answer this question correctly. This problem was to simplify a logarithmic expression with 2 terms to a single logarithmic term using the properties of logs. One of the original terms contained a radical. So we think that this question was overly difficult because of the combining of concepts from across the course, and because logarithms are covered at the end of course and students just hadn't had enough time to digest the material to the level of competency needed for such a difficult question. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** workshops on designing good assessment items that are appropriate for the level and experience of the students.	12/01/2014 - Work with colleagues to develop better assessment questions

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		Resource Request: Workshops on designing good assessment items that are appropriate for the level and experience of the students.	
Department - Mathematics (MATH) - MATH 105 - INTERMEDIATE ALGEBRA - Applications and Modeling - Apply appropriate function in a contextualized situation (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Online assessment using Course Compass from Pearson given to all sections: Solve problems by writing equations containing rational expressions. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of students who take the assessment will answer correctly.		
	Assessment Method: open ended question **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% of students get 9 or more of 12 possible points		
	Assessment Method: A multiple choice question on the final exam was used to assess this SLO. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% answered correctly.	06/27/2014 - 65% of the students assessed got the question correct. We choose one of the more difficult application problems about rates of people working together to complete a job. So we feel that although we missed the target by 5% that the result is actually quite good given the difficulty of the assessment item. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** PD Workshop with outside experts on assessment.	12/01/2014 - Work with colleagues to develop better assessment questions
Department - Mathematics (MATH) - MATH 108 - ACCELERATED ALGEBRA - Graphs	**Assessment Method:** Online assessment using internet course		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
of Functions - Identify and describe the basic shape of the graph of the following functions: linear, absolute value, rational, radical, quadratic, cubic, exponential, and logarithmic (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	management assesessment system administered to students: Recognize the graph of a polynomial function from the degree of the polynomial. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of the students taking taking the assessment will answer correctly.		
	Assessment Method: Assessed using a question(s) on the final exam. **Assessment Method Type:** Exam - Course Test/Quiz	10/07/2014 - 85% of the students who took the final exam in Winter 2014 got the question on the final exam related to graphing correct. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	
Department - Mathematics (MATH) - MATH 108 - ACCELERATED ALGEBRA - Solving Equations - Solve algebraically, graphically, or numerically the following: linear inequalities and linear, absolute value, rational, radical, polynomial, exponential, and logarithmic equations (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Online assessment using internet course management assesessment system administered to students: Solve equations that contain radical expressions. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of the students taking taking the assessment will answer correctly.		
Department - Mathematics (MATH) - MATH 108 - ACCELERATED ALGEBRA - Simplifying Expressions - Simplify the following expressions: linear, rational, radical, polynomial, exponential, and logarithmic (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Online assessment using internet course management assesessment system administered to students: Use rational exponents to simplify radical expressions. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of the students taking taking the assessment will answer correctly.		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Mathematics (MATH) - MATH 108 - ACCELERATED ALGEBRA - Applications and Modeling - Apply appropriate function in a contextualized situation (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Online assessment using internet course management assesessment system administered to students: Solve problems by writing equations containing rational expressions. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of the students taking taking the assessment will answer correctly.		
Department - Mathematics (MATH) - MATH 11 - FINITE MATHEMATICS - Probability - Student will be able to find the probability of various events. (Created By Department - Mathematics (MATH)) **Start Date:** 04/08/2013 **End Date:** 06/28/2013 **Course-Level SLO Status:** Active	**Assessment Method:** Students were given a chart of data and asked to compute 6 probabilities (including conditional probability) based on the data. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80%		
	Assessment Method: Students answered a question on the final exam related to this topic. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 60%	12/30/2013 - 60% of students answered this problem correctly. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Continue funding of PSME Center staff capable of helping students with probability problems. **GE/IL-SLO Reflection:** This problem requires students to think both creatively and also to compute a probability and this supports both of these GE/IL-SLOs. **Related Documents:** M11_ProbabilityProblem.rtf	12/30/2013 - Continue staffing PSME Center with instructors capable of helping students with probability computations.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Mathematics (MATH) - MATH 11 - FINITE MATHEMATICS - Financial Math - Student will be able to use financial math to compute the interest. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Students completed a problem on the final exam to assess this SLO. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 60%	12/30/2013 - 70% of students answered this problem correctly. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Continue funding of PSME Center staff capable of helping students with financial math problems. **GE/IL-SLO Reflection:** This problem tests creative thinking and computation and thus is related to both of these GE SLOs. **Related Documents:** M11_FinancialMathProblem.rtf	12/30/2013 - Continue support of staff in PSME Center capable of helping students with problems involving financial math.
Department - Mathematics (MATH) - MATH 11 - FINITE MATHEMATICS - Linear Programing - Student will be able to use linear programming to optimize a function. (Created By Department - Mathematics (MATH)) **Start Date:** 04/08/2013 **End Date:** 06/28/2013 **Course-Level SLO Status:** Active	**Assessment Method:** Students were given a word problem and asked to maximize the profit. The problem required students to model the scenario with a system of linear inequalities and to solve using the Simplex method. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70%		
	Assessment Method: Students answered a question on the final exam related to this SLO. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 60%	12/30/2013 - 30% of students were able to answer this problem correctly. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Continue funding of PSME Center staff capable of helping students with linear programming problems. **GE/IL-SLO Reflection:**	01/12/2014 - Since linear programming occurs somewhat early in the course, more review on this topic is warranted before the final exam. 12/30/2013 - Continue staffing the PSME Center with instructors capable of helping students with linear programming problems.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		This assessment involves both creative thinking and computation and this is related to both of these GE SLOs. **Related Documents:** M11_LinearProgrammingProblem.rtf	
Department - Mathematics (MATH) - MATH 12 - CALCULUS FOR BUSINESS & ECONOMICS - Applications - A student will be able to apply elementary ideas of single variable differential and integral calculus to the solution of application problems from the business, economics, and the social sciences. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** A multiple choice question was created to address this SLO **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70 % correct.		
	Assessment Method: Multiple choice question on the final exam testing student comprehension of total sales as a definite integral of the rate of sales over a given time period. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of students were able to answer the problem correctly.	07/05/2014 - 50% of the class was able to answer this prompt correctly. The most common mistake was to find the rate of sales at the end of the interval rather than integrating the rate of change of sales over the given time interval. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Continued funding of PSME Center to provide for tutors to help students learn concepts in this class. **GE/IL-SLO Reflection:** To answer the prompt correctly students must perform an integral computation and also think critically and creatively (to identify that the solution requires an integral involving the rate of sales function). So this prompt addresses the Communication and Creative, Critical, and Analytical Thinking GE competencies. **Related Documents:** M12_SLO_Prompt-Sp2014.pdf	07/05/2014 - Spend more time addressing the concept of using a rate function to give the total change of a function. Many students evaluated the rate function rather than integrating it.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Mathematics (MATH) - MATH 12 - CALCULUS FOR BUSINESS & ECONOMICS - Mathematical Language and Notation - A student will be able to discuss and write solutions to applied calculus problems from business, economics, and the social sciences using appropriate mathematical language and notation. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** A three-part question was administered to the students. The question required students to compute, discuss and write up a solution. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70 % average on this question.		
	Assessment Method: A written project asking students to solve an applied problem from business and write up their findings in a paper was given to students. **Assessment Method Type:** Class/Lab Project **Target for Success:** At least 70% of students scored at 70% or higher on the exam.	07/05/2014 - 100% of students were able to get at least 70% on the written assessment. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Continued funding of PSME Center to provide for tutors to help students learn concepts in this class. **GE/IL-SLO Reflection:** This written project required students to communicate their understanding of concepts learned in the class as they related to mathematica optimization of a function. Then students were asked to put this understanding into a long formal written report to the instructor. The project therefore addresses the Communication and Creative, Critical, and Analytical Thinking GE SLOs. **Related Documents:** M12_SLO_ProjectPaper_Sp2014.pdf	07/05/2014 - Continue assigning a written project in this class. Students demonstrated their understanding of a difficult area of mathematics and presented high quality documents in fulfillment of this requirement.
Department - Mathematics (MATH) - MATH 1A - CALCULUS - Differentiation - Use derivatives to graph, and to model and solve application problems using accurate mathematical notation. (Created By	**Assessment Method:** common final: Suppose f(x) and g(x) are both differentiable at x=a. Let h(x)=f(x)/F(x), where F(x)=f(g(x)). If f and g are defined in the table, find h'(a)		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	x f(x) f'(x) g(x) g'(x) a -1 -2 2 1/2 2 3 -3 7 5 **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% success rate		
	Assessment Method: Common Final - Written/Open ended problem on using calculus to minimize the cost of making a certain box (see attached related document). **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% of the students will get at least a C (70%) or better on this problem. **Related Documents:** MATH 1A SLO #2 W'13		
	Assessment Method: A multiple choice question common to instructor's final exams. (See attached document). **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% or more of the students will select the correct answer choice for each question.	01/11/2014 - SLO 2-2: Of the 10 sections of MATH 1A in the fall 2013 quarter, 8 courses used this question in the form of multiple choice, 1 course used this question in a written form, and 1 course used an entirely different version and was in the written form. 78% of the students successfully answered this question (correct multiple choice answer or C or better on written answer). Overall, the success rate for this problem is satisfactory. However, as we explore offering math classes online, we are concerned about equity. It is worth noting that only 67% of the online students answered this question successfully. That suggests that the resources that we offer students in person may not be as beneficial to online students. To support the population of online students, we may need to consider alternative support resources. **Result:** Target Met **Year This Assessment Occurred:**	01/11/2014 - Since the success target was met, there doesn't seem to be any action plan other than to continue to do what is currently being done. So, continue with MATH 1A workshops and STEMWay grant focus.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		2013-2014 **Resource Request:** Continue funding for MATH 1A workshops **Related Documents:** SLO 2-2 (1A-F13).pdf Alternate Written Version of SLO 2-2 (1A-F13).pdf	
		01/11/2014 - SLO 2-1: In the Fall 2013 quarter, there were 10 sections of MATH 1A. 1 of these sections was online and 9 were face-to-face. Of the 10 total sections, 9 used the multiple choice version exactly as designed, and one instructor used the same problem but in a written version. 43% of the students successfully answered this question (correct multiple choice answer or C or better on written answer). It is worth noting that only 37% of online students were successful with this question. This suggests that online students may need their own set of resources/supports to develop equity between the online/face-to-face formats. Of the 4 SLO questions asked on the final exam during the fall 2013 quarter, this question had (by far) the worst results. The overall consensus of why this one was so bad is because of a few reasons: (a) Students are not as familiar with optimizing the derivative function; they are used to optimizing the original function (b) One of the multiple choices provided on this problem was actually the critical number for the derivative where the question asked to find the minimum slope. Suspicion is that many students selected the critical number as the answer, showing that they understood the main concept of the problem, but failed to insert the critical number into f'(x) to find the minimum slope correctly. This seems to be consistent with the fact that the students who had a written version of the problem did better, as the instructor was able to see their work and thought process (c) The topic of optimization is still one of the leading topics of struggle for MATH	01/11/2014 - Continue the MATH 1A workshops and try to get more students attending the workshops. Try to incorporate the topic of optimization earlier in the course and continue introducing it so that students are more familiar when the topic is studied more in depth at the end of the course. Keep producing more work sheets and handouts with this topic throughout the course.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		1A students. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Continue with the MATH 1A workshops and request extra handouts and worksheets for students to study and explore the topic of optimization. Information on appropriate resources for online students. **Related Documents:** SLO 2-1 (1A-F13).pdf	
	Assessment Method: A multiple choice question which is common to all instructors final exam. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of the students will select the correct multiple choice answer. **Related Documents:** MATH1ASLOQuestionFall2014.pdf	12/31/2014 - All 6 full-time instructors teaching math 1a this quarter put this question on their final exam. In total, 132/224 students selected the correct answer to this problem. This is roughly 59% of students getting the correct answer. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Continue to implement the new system of early alert to identify at-risk students and also utilize the NSF Grant to increase the student's retention in this course. **GE/IL-SLO Reflection:** The question asked for this SLO this quarter tested student's abilities to reason about the concept of slope through graphs. That is, the students where given a piecewise defined function, and then were given 5 choices of graphs which represented the slope at every point of the original function. This is a huge part of the content of this course-understanding how the slope of a function changes as its input values change. The results for this question are not	12/31/2014 - Continue to utilize our new system of early alert recently added to the PSME Division. Explore the usefulness of the test corrections. Some instructors use them, some do not. How this affects student's expectations and success in the course is not known. How the students understanding of the content is not known either. There is no real data yet showing whether the corrections work or not, and whether student's expectations in the course change based on instructors utilizing the corrections or not.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		satisfying, and it was definitely expected to be higher. Reasons for the results being low can be summarized as follows: 1) A few of the instructors expressed after the question was administered that they spent most of their time in class focusing on doing problems like this, but in the other direction. That means that students were mostly given the graph of the slope function (derivative) and then students needed to determine the correct original graph (antiderivative). 2. Some sections of the course allowed students to do test corrections, while some did not. How this affected the results is not directly determined, but does seem to play a factor in some way. 3. One section of the course was had a permanent instructor change during the latter half of the quarter. Students needed to adjust accordingly and it seemed that the expectations of the students were different among the two instructors. Students were used to one style of an instructor and then had to completely readjust with only a few weeks left in the quarter. Overall, there should be a better success rate here for this question in this course. What types of problems instructors focus on in class does seem to vary from quarter to quarter, and perhaps this was just one of those quarters that this type of problem was not an emphasis in their course. Though, the concept of the problem is essential to the success of a student in this course.	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		The good thing is that among the five choices for this problem, there were really only two choices that made real sense when selecting an answer. The consensus among instructors was that the majority of the students who missed this problem, actually selected the 'best' wrong answer. Meaning that they showed an understanding about the slopes of the lines in the original function, but then had trouble picking the correct slope of the given parabolic portion of the original problem. **Related Documents:** MATH1ASLOQuestionFall2014.pdf	
Department - Mathematics (MATH) - MATH 1A - CALCULUS - Limits and Derivatives - Define, calculate with various techniques, and demonstrate an understanding of, limits, derivatives, and simple antiderivatives using accurate mathematical notation. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** common final: Find the vales of a and b that make the following function differentiable everywhere: f(x)= {x^2 for x less or equal to 2; ax+b for x >2} **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% success rate		
	Assessment Method: Open Ended Question on a Common Final - Use the definition of the derivative to find the derivative function given some f(x) and using correct limit notation and algebra skills. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% of the students will get a C (70%) or better on this question.		
	Assessment Method: Multiple Choice question appearing on each instructor's final exam. (See attached document). **Assessment Method Type:** Exam - Course Test/Quiz	01/11/2014 - SLO 1-2: Of the 10 section of MATH 1A in the fall 2013 quarter, 9 sections chose to give this problem in the multiple-choice form, and 1 section chose to give the same problem but in written form. 63% of students successfully answered this question (correct multiple choice	01/11/2014 - Work as a team to decide on a level of coverage for topics recently added to Math 1A COR based on CID. Continue Math 1A Workshops to support the

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	Target for Success: 70% or more of the students will select the correct answer choice for this problem.	answer or C or better on written answer). 9/10 of the sections offered this question in multiple-choice form and had a 72.9% success rate, which met the target of at least 70%. The section which had a written form of the problem only had a 17.24% success rate, which is a very high discrepancy. It should also be noted that the CID recently required derivatives of parametric curves to be part of the COR for this class, and this was the first quarter (disregarding Summer 2013 courses) in which this was implemented. As we adjust to many changes due to CID, we will have to work together to determine the level at which we will cover these new topics. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Continue with MATH 1A workshops and STEMWay grant focus **Related Documents:** SLO 1-2 (1A-F13).pdf	addition of this new math 1A material.
		01/11/2014 - SLO 1-1: Of the 10 sections of MATH 1A in the fall 2013 quarter, 8 sections used the multiple-choice version, 1 section used the same question but in a written form, and one section used an entirely different question. 83% of the students successfully answered this question (correct multiple choice answer or C or better on written answer). The MATH 1A instructors are pleased with the results for this problem this quarter. In an alternate version of the problem, students were asked to manipulate indeterminate forms of limits which were a little more complex, while the multiple choice version of the problem had students just finding a limit where they could factor and simplify. As expected, the students who had the more complex version did not perform quite as well as the students who had the simpler version.	01/11/2014 - Continue with the MATH 1A workshops and also with the work that is being done in the STEMway grant.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		Result: Target Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Continue with the MATH 1A workshops. **Related Documents:** SLO 1-1 (1A-F13).pdf Alternate Version of SLO 1-1 (1A-F13).pdf	
Department - Mathematics (MATH) - MATH 1B - CALCULUS - Fundamental Theorem of Calculus - A successful student will be able to approximate definite integrals and evaluate them exactly, using either areas or the Fundamental Theorem of Calculus, as appropriate. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Two multiple choice questions: one for evaluating with the FTC and the other for estimating. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% correct		
	Assessment Method: An open-ended two part question was given on the final exam. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** Target for success to be at least 70% on both parts.		
	Assessment Method: Multiple-choice question on common final exam **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% of students get question correct.		
	Assessment Method: Multiple choice question on final exam. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:**	04/14/2014 - 117/127 = 92% of students answered this question correctly. This assessment didn't yield very useful info and faculty expressed an interest in assessing other skills, suggesting that we revisit our SLO's and consider writing better	12/02/2014 - Explore possible revamp of SLO's within department, focusing on alignment with Common Core: Conceptual Understanding, Procedural Fluency, Application.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	Goal: 80% of students get this correct. (It's a very straight-forward question.) **Related Documents:** Assessment Questions for Math 1B, W2014.docx Assessment Questions for Math 1B, W2014.pdf	SLO's to support more meaningful assessments. For example, it would be interesting to see how students do on integration exam, which tests all techniques of integration, which is different than testing the use of the Fundamental Theorem of Calculus. We believed for several years that we had to assess all SLO's in every section every year. That felt ridiculous and not helpful. Not that we know that we can focus on one SLO per year, we feel that we can make the process more meaningful and helpful. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** PD Workshop with outside experts on assessment. **GE/IL-SLO Reflection:** This assessment requires students to carry out mathematical computations. **GE/IL-SLO Reflection:** This assessment requires students to carry out mathematical computations. **Related Documents:** Assessment Questions for Math 1B, W2014.pdf	The goal would be to develop better SLO's and work together to create more meaningful assessments. 05/05/2014 - Work with office of instruction to bring in experts on assessment to help improve our SLO's and the assessment thereof.
Department - Mathematics (MATH) - MATH 1B - CALCULUS - Applications - A successful student will be able to model, solve, and interpret (in context) application problems involving definite integrals or first order separable differential equations. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** open ended question about differential equations **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% of students answer correctly		
	Assessment Method: Three part problem involving the first order separable differential equation was given on the final exam. **Assessment Method Type:**		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	Exam - Course Test/Quiz **Target for Success:** At least 70% of the class achieves at least 75% of the problems correct.		
	Assessment Method: A four-part open-ended question was given on a common final exam **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** Average score above 70%. **Related Documents:** 1B.SLO Problem.F2012		
	Assessment Method: A multiple-choice question was included on Final Exam by most instructors. One instructor chose to give an alternative, open-ended question on the final. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** Goal: 70% of students get this correct. **Related Documents:** Assessment Questions for Math 1B, W2014.pdf Assessment Questions for Math 1B, W2014.docx	04/14/2014 - 66% of students answered this question successfully. Instructors shared many observations, suggesting that further discussion on assessment techniques would be welcomed. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Professional development activity on assessment. **GE/IL-SLO Reflection:** This problem really tests students on their critical reading skills as well as their critical thinking and possibly their computation skills (though it is possible that students used solution curves that they "remembered" rather than solving). **Related Documents:** Assessment Questions for Math 1B, W2014.pdf	04/14/2014 - Discuss recent changes to CORs due to CID and work towards a shared understanding of the level at which we cover topics (since more topics have been added to this course). 04/14/2014 - Work as a team to discuss content and assessment.
Department - Mathematics (MATH) - MATH 1B - CALCULUS - Mathematical Language and Notation - A successful student will be able to understand, interpret, and use appropriate mathematical language and	**Assessment Method:** Students asked to briefly discuss the meaning of half-life. **Assessment Method Type:** Exam - Course Test/Quiz		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
notation when solving integration problems. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Target for Success:** 80% give clear, correct answers		
	Assessment Method: A four part question was given on the final exam. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% of the class achieves at least 75% correct.		
	Assessment Method: Open-ended question on final exam **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** Average score above 70%.		
	Assessment Method: Multiple Choice Question on Final Exam **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of students will answer this correctly. **Related Documents:** Assessment Questions for Math 1B, W2014.pdf Assessment Questions for Math 1B, W2014.docx	04/14/2014 - 50% of students answered the multiple choice question correctly. However, many more answered it mostly correctly. So although we did not meet our target, we feel OK about how students performed. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** A workshop on test-taking skills would be useful. Also funding for PD activity on SLO's and Assessment. **GE/IL-SLO Reflection:** This problem does an excellent job of testing higher-order thinking skills, such as "comparing," "computing," and critical reading, including reading of mathematical notation. There is a heavy load for critical thinking, because a student has to plan out how they can systematically evaluate the veracity of each claim. **Related Documents:** Assessment Questions for Math 1B,	04/14/2014 - Work on SLO's and Assessment techniques.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		W2014.pdf	
Department - Mathematics (MATH) - MATH 1C - CALCULUS - Sequences and Series - Students will be able to apply the theories and techniques of sequences and series to solve application problems. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** In class #1, students were given 20 minutes to complete the three assessment questions. The teacher graded the results. In class #2, each student was given 25 minutes to complete the three assessment questions. They exchanged papers and graded each others paper on a scale of 0 -5. A score of 3 or higher is considered at least a C grade. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of the students will get at least a C grade. **Related Documents:** SLOfor Math1CQuestions.doc		
	Assessment Method: Students were given the question and asked to answer the question. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of the students will get a grade of C or better.		
	Assessment Method: The students were given a free-response question on the final exam. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of the students will score 70% or better on this question.	01/27/2014 - 14 out of 21 students were able to get a C grade of better on this question. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Talk with other teachers about assessment. Need money and time to do this **GE/IL-SLO Reflection:** Computation and critical thinking **Related Documents:**	01/27/2014 - Meet with other teachers to talk about assessment.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		M1C_SLO_F13_MJF_pdf.pdf	
		01/27/2014 - On the question only 17 out of 41 students got a C grade of better. This was a conceptual question and not a process question. The students do better on process related questions. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Time and money for discussions/professional development on curriculum, pedagogy, and assessment, with a focus on choosing a balance between process and concepts, and the development of higher order thinking skills throughout our sequences. **GE/IL-SLO Reflection:** This is a communication and thinking skills question. They were not able to think creatively. **Related Documents:** M1C_SLO_F13_pdf.pdf	01/27/2014 - Get faculty together to talk about the balance between procedural and conceptual learning and assessment. It would be especially useful to nurture discussions between faculty teaching various levels of precalculus and calculus. it would be useful for instructors teaching courses earlier in a sequence to understand the mathematical/thinking needs of students in more advanced classes.
		12/13/2013 - 12 out of 21 students (57%) scored 70% or better on this question. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Support to meet to discuss curriculum. **Resource Request:** Support to meet to discuss curriculum.	12/13/2013 - Revisit how the topics are distributed in the calculus courses; with so many topics packed into Math 1C, it is difficult for students and instructors to do justice to the topic of sequences and series.
Department - Mathematics (MATH) - MATH 1C - CALCULUS - Multivariable functions and relations - Students will be able to apply the theories and techniques of functions and	**Assessment Method:** In class #1, students were given 20 minutes to complete the three questions. The teacher graded the papers.		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
relations of many variables to solve problems. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	In class #2, each student was given 25 minutes to complete the questions. The students then exchanged papers with other students and graded other student's papers on a scale of 0 - 5. A score of 3 or higher is considered at least a C grade. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of the students will get a grade of C or higher. **Related Documents:** SLOfor Math1CQuestions.doc		
	Assessment Method: Students were given the question and asked to answer the question **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of the students will get a grade of C or higher.		
	Assessment Method: The students were given a free-response question on the final exam. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of the students will score 70% or higher.	01/27/2014 - 10 out of 21 students were able to get a C or better on this question. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Talk with other teachers about assessment. Need money and time to do this **GE/IL-SLO Reflection:** Computation and critical thinking. **Related Documents:** M1C_SLO_F13_MJF_pdf.pdf	01/27/2014 - Meet with other teachers to discuss assessment norms.
		01/27/2014 - 21 of 41 students answered this question correctly. This was a conceptual question and not a process oriented question. Students had difficulty with this question. **Result:** Target Not Met	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		Year This Assessment Occurred: 2013-2014 **Resource Request:** Money and time should be provided so that teachers can get together and talk about what is important in terms of learning. Students are good at process oriented questions, but have difficulty with conceptual questions that require originality of tho **GE/IL-SLO Reflection:** Thinking skills, reasoning. Computation. **Related Documents:** M1C_SLO_F13_pdf.pdf	
		12/13/2013 - 15 out of 21 students (71%) scored 70% or higher on this question. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** More time or less topics to teach Math 1C **GE/IL-SLO Reflection:** This question gave the students a real-world application of a function of two variables. The students were asked to determine the domain and range of the function, describe level curves of the function and solve problems using this function. In order to answer this question, students needed to have good computation skills, good written communication skills to describe level curves and good analytical thinking skills.	
Department - Mathematics (MATH) - MATH 1C - CALCULUS - Applications involving Differential Calculus - Students will be able to apply the theories and techniques of differential calculus including directional derivatives and gradient vectors to solve	**Assessment Method:** In Class #1, students were given 20 minutes to complete the three assessment questions. The teacher graded the papers. In class #2, each student was given 25 minutes to complete the questions. The		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
application problems. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	students then exchanged papers with other students and graded other student's papers on a scale of 0 - 5. A score of 3 or higher is considered at least a C grade. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of students will score a grade of C or higher. **Related Documents:** SLOfor Math1CQuestions.doc		
	Assessment Method: Students were asked the question and then answered the question **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of the students will get a C grade or higher		
	Assessment Method: The students were given a free response question on the final exam. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of the students should score 70% or higher.	01/27/2014 - 11 out of 21 students were able to get a C grade or better on this question. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Talk with other teachers about assessment. Need money and time to do this **GE/IL-SLO Reflection:** Computation and critical thinking. **Related Documents:** M1C_SLO_F13_MJF_pdf.pdf	01/27/2014 - Meet with other teachers to discuss assessment.
		01/27/2014 - 39 out of 41 students were able to get a C grade of better on this question. This was a more process oriented question and students did well. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	01/27/2014 - I still think that talking with other teachers about assessment is key. My students did well on process questions and not so well on conceptual questions.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		Resource Request: None **GE/IL-SLO Reflection:** Computation and critical thinking **Related Documents:** M1C_SLO_F13_pdf.pdf	
		12/13/2013 - 17 out of 21 (81%) students scored above 70% on this question. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** More time or less topics to teach Math 1C **GE/IL-SLO Reflection:** This problem involved a real-world application that required students to understand level curves, directional derivatives and gradient vectors. To answer this question successfully, the students needed to have good computation skills to determine the directional derivative and gradient vector. They also needed to have good critical thinking skills to connect when the problem was asking them to find the directional derivative and the gradient vector since it was a real-life application.	
Department - Mathematics (MATH) - MATH 1D - CALCULUS - Computation - A student will be able to perform various types of computations involving double and triple integrals, parameterization of curves and surfaces, and line and flux integrals. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** A multiple choice pop quiz was given during class time. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of students should be able to answer this correctly.		
	Assessment Method: Multiple-choice problem requiring students to compute the value of a double integral **Assessment Method Type:**		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	Exam - Standardized **Target for Success:** 70% or more of students can answer the problem correctly.		
	Assessment Method: Written answer to question prompt on an exam. **Assessment Method Type:** Exam - Standardized **Target for Success:** 70% or more of students are able to answer the prompt correctly, with minimal error on the part of students.		
	Assessment Method: On the final exam of the 2014 Spring Quarter, students had a mass/volume problem that required either a triple integral or a double integral. **Assessment Method Type:** Exam - Standardized **Target for Success:** Class average of 70%	07/07/2014 - The section 01 class average of 34 exam takers was 86%, with a median of 100%. The section 02 class average of 28 exam takers was 70%, with a median of 81%. Even though the target for success was met by both sections, three (two of them just showed up for the final without attending class regularly) from section 01 and seven from section 02 did very poorly on this, which is a basic concept of the course. Most of them are students with very weak foundations from the previous math classes. It is a challenge to teach those students in the same class as students who want to challenge themselves. As a result of the wide range of performances amongst students, the averages and the medians from both sections are different with more than a 10% gap. It would be helpful if there are some workshops available at the PSME Center specifically for students who need some review especially from Math1C. It is key to communicate with the center to initiate collaboration for those students at the beginning of the quarter. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		Resource Request: Review sessions from previous calculus classes available in the PSME Center	
Department - Mathematics (MATH) - MATH 1D - CALCULUS - Divergence and Curl - A student will be able to demonstrate an understanding of the concepts of divergence and curl as well as key theorems related to these concepts (e.g., the Divergence Theorem and Stoke's theorem). (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** A multiple choice problem with answers supported by written explanation for choice of answer was given on the topic of Green's Theorem on a scheduled exam. **Assessment Method Type:** Exam - Standardized **Target for Success:** At least 70% of students can answer the question correctly and support with a coherent explanation for their choice.		
	Assessment Method: Multiple-choice problem from final exam requiring students to compute a line integral using Stoke's Theorem **Assessment Method Type:** Exam - Standardized **Target for Success:** 70% or more of students can answer this question correctly.		
	Assessment Method: Written response question testing student knowledge of the Divergence Theorem **Assessment Method Type:** Exam - Standardized **Target for Success:** 70% of students are able to answer the question correctly.		
	Assessment Method: On the week 11 of the 2014 Spring Quarter, students had a 2D vector field with 5 sub-problems that asked conceptual questions including Green's Theorem. **Assessment Method Type:** Exam - Standardized **Target for Success:**	07/07/2014 - The section 01 class average of 32 exam takers was 76%, with a median of 78%. The section 02 class average of 28 exam takers was 80%, with a median of 90%. Even though the target for success was met by both sections, it was a challenging quarter. The	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	Class average of 70%	section 01 morning class was quieter and asked less questions than the section 02 evening class. Both classes had three to four students who seemed totally lost. Throughout the quarter, the students in general looked very tired and had difficulty focusing after they received acceptance/reject letters from the universities they applied to for transfer. It was quite challenging to engage them in classes when they were ready to transfer. A couple of students privately confessed that he/she was too exhausted to focus on studying after the busiest Winter Quarter. Several times I had to mention their performance in comparison to other quarters to remind them of the course requirement to transfer. It would be helpful to have some interviews from the students who weren't able to pass, and to share them with future students especially in the Spring Quarter. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	
Department - Mathematics (MATH) - MATH 217 - INTEGRATED STATISTICS I - Experimental Design - Successful students will be able to assess the design of a study or experiment to determine which conclusions or generalizations would be appropriate. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Problem #6 from the Carnegie Mid-Course assessment package. See related document. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% of student should get the correct answer. **Related Documents:** Math217Problem6.JPG	10/06/2014 - 75% got the correct answer **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **GE/IL-SLO Reflection:** Experimental Design is an example of citizenship and critical thinking. You must create a good design or you may be communicating invalid results. The design itself requires critical thinking.	
	Assessment Method: #8 on the Carnegie Foundation Common, MidCourse Exam #8 was about random assignment **Assessment Method Type:** Exam - Course Test/Quiz		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	Target for Success: 70% correct		
Department - Mathematics (MATH) - MATH 217 - INTEGRATED STATISTICS I - Data Analysis and Displays - Successful students will be able to analyze, summarize and interpret data, making appropriate choices regarding numerical summaries and graphical displays. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Problem #11 from the Carnegie Mid-Course assessment **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% of the student will get it correct. **Related Documents:** Math217Problem11.JPG		
	Assessment Method: #12 on the Carnegie Foundation midcourse exam #12 was about choosing the most appropriate display **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% correct	10/06/2014 - 75% got it correct **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **GE/IL-SLO Reflection:** Critical thinking and communication are needed for this outcome	
Department - Mathematics (MATH) - MATH 217 - INTEGRATED STATISTICS I - Using Models to Make Predictions - Successful students will be able to interpret the parameters of both linear and exponential models and use these models to make predictions. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Problem #24 from the Carnegie Mid-Course assessment **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% of student get it correct **Related Documents:** Math217Problem24.JPG		
	Assessment Method: #18 on the Carnegie Foundation Common, MidCourse Exam #18 -interpret the slope of an LSR **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% correct	10/06/2014 - 75% got this correct **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **GE/IL-SLO Reflection:** This objective requires critical thinking and communication skills	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		GE/IL-SLO Reflection: This objective requires critical thinking and communication skills **GE/IL-SLO Reflection:** This objective requires critical thinking and communication skills	
Department - Mathematics (MATH) - MATH 217 - INTEGRATED STATISTICS I - Probability - Successful students will be able to determine the likelihood of events. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** End of Academic Year **Start Date:** 09/24/2012 **End Date:** 12/14/2012 **Course-Level SLO Status:** Active	**Assessment Method:** #38 on the Carnegie Foundation Common, MidCourse Exam #38 was about long run behavior **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% correct	10/06/2014 - 75% got this correct **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **GE/IL-SLO Reflection:** This objective requires communication and computation and critical thinking	
Department - Mathematics (MATH) - MATH 22 - DISCRETE MATHEMATICS - Relations - Identify salient properties of relations (Created By Department - Mathematics (MATH)) **Assessment Cycles:** End of Academic Year **Start Date:** 09/24/2012 **End Date:** 06/28/2013 **Course-Level SLO Status:** Active	**Assessment Method:** Count the number of correct responses **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% of the students will answer the question correctly		
Department - Mathematics (MATH) - MATH 22 - DISCRETE MATHEMATICS - Logic and Proofs - Use formal logic and various methods of arguments to formally write proofs involving number theory, set theory, combinatorics, and discrete probability.	**Assessment Method:** On the final exam, students are to use formal logic to determine the validity of a series of given arguments. **Assessment Method Type:** Exam - Course Test/Quiz		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
(Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Target for Success:** 80% of the students will correctly apply formal logic to draw valid conclusions.		
Department - Mathematics (MATH) - MATH 22 - DISCRETE MATHEMATICS - Number Theory and Applications - Apply number theory, combinatorics, discrete probability, graph theory, and recursion to solve various application problems. (Created By Department - Mathematics (MATH)) **Start Date:** 09/26/2011 **End Date:** 06/29/2012 **Course-Level SLO Status:** Active	**Assessment Method:** Students are given a written final exam. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% of the students will earn 75% or better questions related to this SLO		
	Assessment Method: Extended problem investigation **Assessment Method Type:** Case Study/Analysis **Target for Success:** 80% satisfactory completion **Related Documents:** Mathematics of Gerrymandering	10/10/2014 - The assessment prompt (included as a related document) asked students to mathematically investigate the theoretical limits of gerrymandering, and to apply their findings to an earlier result they had discovered empirically. Of the 19 students remaining in the class at the time of the prompt, twelve completed the assessment on time at a level that I considered to be acceptable or better, and three others eventually completed the assessment at an acceptable level. Three failed to complete the assessment at all, and one student declined the opportunity to redo a paper that I considered to be unacceptable. Fifteen of 19 students successfully completing the assessment is 79%, compared to our target of 80%, but I'm going to call it met. Nearly all students who complete the assessment at all can do so acceptably well, so the challenge remains how to structure this and other assessments so that students complete them on time. An assessment submitted late is not comparable to one completed on time, so provides weaker evidence to support a grade. **Result:** Target Met **Year This Assessment Occurred:**	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		2013-2014	
Department - Mathematics (MATH) - MATH 220 - ELEMENTARY ALGEBRA - Linear and Quadratic equations - Solve algebraically, graphically, and numerically linear equations, linear inequalities in one variable, linear systems of equations, and quadratic equations. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Multiple choice question on determining the correct solution set in interval notation to a linear inequality in one variable. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of the students select the correct answer **Related Documents:** MATH 220 SLOs Spring 2012		
	Assessment Method: Solve for a specified variable giving an equation involving all variables. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of students will understand how to apply algebraic properties to isolate a variable. (75% of students will solve the equation correctly.)	10/10/2014 - 60% of the students were able to solve the equation correctly. Students have trouble determining the appropriate properties to apply. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014	10/10/2014 - Give students more practice with such problems throughout the quarter to help solidify concept. Emphasize the properties that can be applied and why.
Department - Mathematics (MATH) - MATH 220 - ELEMENTARY ALGEBRA - Applications - Model and solve application problems using linear equations, linear inequalities, and linear systems of equations. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Multiple choice problem in which the student must determine the correct linear model which reflects the description given in words. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of the students select the correct answer **Related Documents:** MATH 220 SLOs Spring 2012		
	Assessment Method: Students are to accurately write a linear equation to model a given real-world scenario.	10/10/2014 - 60% of the students wrote an accurate equation to model the given scenario. Students identified the correct rate of change but	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	Assessment Method Type: Exam - Course Test/Quiz **Target for Success:** 70% of students will write an accurate equation.	had trouble with identifying an appropriate y-intercept. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014	
Department - Mathematics (MATH) - MATH 220 - ELEMENTARY ALGEBRA - Polynomials and Exponents - Simplify polynomial expressions and exponential expressions with integer exponents. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Multiple choice problem in which the student must determine the correct answer to a problem involving simplifying an expression using the correct rules of exponents. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of the students select the correct answer. **Related Documents:** MATH 220 SLOs Spring 2012		
	Assessment Method: Students are asked to simplify an algebraic expression by applying appropriate properties of exponents. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70%	10/10/2014 - 52% of students were able to simply the problem completely and accurately by applying multiple properties. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014	
Department - Mathematics (MATH) - MATH 230 - PREPARING FOR ALGEBRA - Solve Linear Equation - Solve a linear equation (in one variable) containing rational coefficients and grouping symbols. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** All students will take an exam requiring them to solve equations with fractional coefficients, decimal coefficients, and multiple grouping symbols. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** All students who pass the course will earn 84% or higher on the exam.	01/12/2014 - Although many students need to take the exam 2 or 3 times, the students are consistently able to get 84% or higher on the exam. Students have more difficulty solving equations containing fractions compared to other types of equations. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Mathematics (MATH) - MATH 230 - PREPARING FOR ALGEBRA - Apply linear equations - Write a linear equation to represent a real world application, and interpret the solution in context. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Students will complete an exam including two or three word problems in which they must define variables or variable expressions, write an equation associated with the problem, and clearly state the conclusion in a sentence. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** All students who pass the course will earn 84% or higher on the exam.	01/12/2014 - All students passing the course earned 84% or higher on this exam. Many students must take the exam 2 or 3 times (different versions) to reach mastery since it's usually difficult for them to translate the given problem into expressions and equations. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	01/12/2014 - Instructors should provide more examples on how to set up the expressions and equations needed to solve word problems.
Department - Mathematics (MATH) - MATH 230 - PREPARING FOR ALGEBRA - Proportions and percent - Apply knowledge of proportional reasoning and percent to real applications. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Two exams, one on proportional reasoning, one on percent applications. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** All students who pass the course will earn 84% or higher on each exam.	01/12/2014 - All students who pass the course earn 84% or higher on 2 exams, one covering proportions and one covering percentages. Most students pass the exam on proportions without needing multiple attempts, but some students need to take the exam on percentages more than once (different versions) to achieve this level of proficiency. They are able to calculate direct percentages, but do struggle with setting up the equations needed to solve application problems. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	
Department - Mathematics (MATH) - MATH 230 - PREPARING FOR ALGEBRA - Geometric Formulas - Apply geometric formulas to solve applications involving perimeter, area, and volume. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** An exam requiring knowledge of formulas for perimeter and area of rectangles, triangles and circles. Students must also calculate a volume given a formula. Students not reaching mastery will retake a different version of the exam. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:**	01/12/2014 - All students who pass the class pass an exam covering this outcome with a 84% or higher. Some students struggle with the concepts of area and perimeter in application problems. While some students struggle with determining which formula to use (area or perimeter), others have difficulty computing the area or perimeter of a shape that is composed of more than one basic shape (rectangle, triangle, or circle). **Result:**	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	All students who pass the course will earn 84% or higher on the exam.	Target Met **Year This Assessment Occurred:** 2013-2014	
Department - Mathematics (MATH) - MATH 230J - PREPARING FOR ALGEBRA - Proportions and Percent - Apply knowledge of proportional reasoning and percent to real applications. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Two exams, one on proportional reasoning and one on percent applications. Students not reaching mastery will retake a different version of the exam. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** All students who pass the course will earn 84% or higher on each exam.	07/02/2014 - All students passing the course earned 84% or higher on each exam. Most students took each exam at most twice in order to reach mastery. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	
Department - Mathematics (MATH) - MATH 230J - PREPARING FOR ALGEBRA - Geometric Formulas - Apply geometric formulas to solve applications involving perimeter, area, and volume. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** An exam requiring knowledge of formulas for perimeter and area of rectangles, triangles and circles. Students must also calculate a volume given a formula. Students not reaching mastery will retake a different version of the exam. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** All students who pass the course will earn 84% or higher on the exam.	07/02/2014 - All students passing the course earned 84% or higher on the exam. Except for one student, those who passed the course reached mastery on the first attempt. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	
Department - Mathematics (MATH) - MATH 235 - PREPARING FOR ALGEBRA: REAL NUMBERS - Order of Operations - Without a calculator, perform the order of operations to find the value of an expression involving whole numbers, fractions, decimals, and/or signed numbers. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** The students will complete 4 exams (whole numbers, fractions, decimals, signed numbers) involving these calculations. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** All students passing the class will earn 87% or higher on each exam.	01/12/2014 - Because students are allowed to retake a different version of the exam if 87% is not reached, all students passing did reach the 87%. Order of operations with fractions, signed numbers, and absolute values seemed to be the toughest for students. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Mathematics (MATH) - MATH 235 - PREPARING FOR ALGEBRA: REAL NUMBERS - Convert between number forms - Convert between whole numbers, fractions, mixed numbers, and decimals. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Students will complete a module B and module C exam requiring conversion between these number forms. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** All students passing the course will earn 87% or higher on both exams.	01/12/2014 - All students reached 87% or higher on the exams. When converting a decimal number to a fraction, students often forgot to reduce their answer. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	
Department - Mathematics (MATH) - MATH 235 - PREPARING FOR ALGEBRA: REAL NUMBERS - Apply operations with rational numbers - Apply operations with whole numbers, fractions, decimals, and mixed numbers to real world problems and interpret the answer in context. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Each exam (whole numbers, fractions, decimals, signed numbers) includes at least two problems requiring real world application of operations. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** All students passing the exam and course will earn 87% or higher on the exams.	01/12/2014 - Because students are allowed to retake exams if 87% is not achieved, all students eventually earned 87% or higher on these exams. However, the applications involving fractions and signed numbers seemed to give the students the most difficulty as students often do not know which operation to use in order to solve the problem. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	01/12/2014 - Instructors should provide more examples of how to solve application problems that involve fractions and signed numbers.
Department - Mathematics (MATH) - MATH 2A - DIFFERENTIAL EQUATIONS - Analytic Techniques - Solve differential equations with appropriate analytic techniques. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Instructor-generated prompt **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% of responses adequate or better		
Department - Mathematics (MATH) - MATH 2A - DIFFERENTIAL EQUATIONS - Differential Equations - Verify solutions to differential equations analytically, numerically, graphically, and qualitatively. (Created By Department - Mathematics (MATH))	**Assessment Method:** Extended problem investigation **Assessment Method Type:** Case Study/Analysis **Target for Success:** 80% successful completion **Related Documents:**	10/10/2014 - The assessment prompt (included as a related document) asked students to numerically and graphically investigate the settling time of a mechanical system as it depends on the damping forces present in the system. Of the 27 students remaining in the class at the	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Course-Level SLO Status: Active	Settling Time	time of the prompt, 26 completed the assessment on time at a level that I considered to be acceptable or better, and the other eventually completed the assessment at an acceptable level. As a result, every student in the class successfully completed the assessment. I will continue to use a version of this assessment. It's a rich and interesting investigation leading to some unexpected results. This term, it generated substantial student interest. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	
Department - Mathematics (MATH) - MATH 2B - LINEAR ALGEBRA - Vector Spaces - Students will be able to understand the concepts of a vector space and prove facts about them. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Students are asked to prove why a given set with specified characteristics is a vector space. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% of students will receive at least 7 points on a 10-point rubric		
	Assessment Method: In the final exam, the students were given a vector space problem. Given a subset of R^3, they determined whether the set was a vector subspace or not. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** class average of 70%		
	Assessment Method: On the final exam of the Winter Quarter of 2014, the students had a subset of R^3 and determined whether the set was a vector space or not. Three more sub-problems were given for discussion about the vector	04/25/2014 - The class average was 92%. On the first day of the quarter, I went over set notation, logic and reasoning. This action was a follow-up of my reflections on Math2B teaching previous quarters. Math2B students seemed to	04/25/2014 - Making Math22 (Discrete Mathematics) a recommended class for taking Math2B on Foothill Class Catalog would be helpful.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	space. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** Class average of 70%	have some difficulty manipulating symbolic notations and grasping the abstractness of axioms. That is why I presented some notation on the first day. On the first day, I also let the students watch successful Math2B students' advices that I interviewed previous quarter. The successful students explained the difference between Math2B and the year-long calculus classes. Throughout the quarter, I reminded the students of this difference. The repetition probably encouraged them even when they felt lost in the beginning due to different types of math than calculus. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	
Department - Mathematics (MATH) - MATH 2B - LINEAR ALGEBRA - Modeling - Students will be able to use a linear system to model a problem. They will use techniques learned in class to solve the system, and interpret the result. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Students are given two modeling problems to solve and interpret. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% of students will receive 14 points or higher on a 20 point rubric.		
	Assessment Method: In the final exam, the students were asked to model a real-life scenario using a linear system, and solve it. Then, they were asked to write a practical interpretation of the solution. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** class average of 70%		
	Assessment Method: At the end of the Winter Quarter of 2014, the students took the final exam where they had two application problems to model, had to	04/25/2014 - The class average was 93% on both problems. In addition to lecturing on applications in class, I asked the students to watch videos of the	09/25/2014 - A variety of more challenge application problems could be introduced.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	solve the associated systems using learned techniques, and interpret the results. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** Class average of 70% on both problems	applications of eigenvalues and eigenvectors before class, and asked them to create an application problem and solve it after class. That procedure reinforced their pre-reading of the application section triple. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	
Department - Mathematics (MATH) - MATH 44 - MATH FOR THE LIBERAL ARTS - Problem Investigation - Investigate problems analytically, numerically, graphically, and verbally. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Development of a mathematical model appropriate for a given data set **Assessment Method Type:** Case Study/Analysis **Target for Success:** 80% of students should successfully complete the assessment **Related Documents:** Moon phase model prompt Data for moon phase prompt	10/10/2014 - The assessment prompt (included as a related document) asked students to fit sinusoidal models to data from the U.S. Naval Observatory about times of local sunrise and sunset, to compare their model with particulars in the data, and to discuss their findings. Of the 21 students remaining in the class at the time of the prompt, eleven completed the assessment on time at a level that I considered to be acceptable or better, and six others eventually completed the assessment at an acceptable level. Three failed to complete the assessment at all, and I referred one student to the dean of student affairs for submitting a paper that it turns out was prepared by her mother. Seventeen of 21 meets our success target of 80%, but I'm at a loss as to how to structure this and other assessments so that students complete them on time. An assessment submitted late is not comparable to one completed on time, so provides weaker evidence to support a grade. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	
	Assessment Method: Develop and analyze a mathematical model from a qualitative description		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	Assessment Method Type: Case Study/Analysis **Related Documents:** Malthusian Prosperity		
Department - Mathematics (MATH) - MATH 48A - PRECALCULUS I - Function Analysis - A successful student will be able to graph, analyze and transform polynomial, power, and root functions. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** A multiple choice question was given to the students. This question provided a graph of the original function and its transformation. The students were to determine what the function of the transformed graph. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% correct		
	Assessment Method: Two multiple choice questions were placed on the final exam to assess these SLOs. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% correct on each problem		
	Assessment Method: multiple choice question **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% correct **Related Documents:** Questions	02/14/2014 - 72 out of 134 answered correctly, that is 53%. Different instructors chose different assessment prompts. Success rates were not uniform across prompts. Upon reflection, instructors rated some prompts as easier than others. The respective success rates were higher, as expected. Good materials and prompts are hard to find in text books. We would like to have discussions about assessment techniques, prompts, and shared expectations. A lot of the 48A sections are taught by part time faculty. We would like to include them in these discussions. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Resources to develop better materials and	02/14/2014 - Create a plan/schedule for material development and collaboration with/mentoring of part-time faculty. Focus will be on rigor, material development, and assessment prompts.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		more mentoring/collaboration with part time instructors. **Resource Request:**	
Department - Mathematics (MATH) - MATH 48A - PRECALCULUS I - Modeling - A successful student will be able to model real-life phenomenon using polynomial, power & root functions, use the model to make predictions, and interpret solutions within the context of the real-life phenomenon (Created By Department - Mathematics (MATH)) **Start Date:** 10/13/2011 **Course-Level SLO Status:** Active	**Assessment Method:** Students were given a free-response question that contained 5 parts. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% for each of the 5 parts. **Related Documents:** M48A_SLOQuestions.doc		
	Assessment Method: One multiple choice question from the final exam was given to students to assess this SLO. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 50% or higher success rate on assessment question		
	Assessment Method: multiple choice question **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% **Related Documents:** Questions	02/14/2014 - 83 out of 134 answered the question correctly, this is 62%. Multi-step problems are harder for students to complete successfully. As expected, students who were assessed using a single-step problem were more successful than those who were assessed via a multi-step problem. This warrants further discussion on rigor as well as assessment. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Resources for providing better materials to instructors and more mentoring/collaboration with part time instructors.	02/14/2014 - Develop collaborative group involving part-time and full-time instructors to discuss rigor, expectations, materials, and prompts.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Mathematics (MATH) - MATH 48B - PRECALCULUS II - Modeling - A successful student will be able to model real-life phenomenon using rational, trigonometric, exponential and logarithmic functions, use the model to make predictions, and interpret solutions within the context of the real-life phenomenon. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** We will give students a multiple choice question that asks them to interpret an inverse function in the context of a real-life situation. **Assessment Method Type:** Exam - Standardized **Target for Success:** We hope that at least 70% of the students gets this problem correct.	12/16/2013 - Five of six sections in fall 2013 gave the students two common questions addressing this SLO in their final exams. 59% of the students got the first question correct, while 45% of the students got the second question correct. One section gave the students open-ended, free-response questions to address this SLO. In this section, all students but 1 scored 100% on this assessment. The disparity in assessment prompts and corresponding results warrants discussion of rigor and assessment techniques. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Time for full-time and part-time faculty to discuss content, pedagogy, expectations and assessment.	12/16/2013 - Meet to discuss rigor, use of technology, and assessment in Math 48B.
	Assessment Method: We will give a question that contains multiple parts. Some of the parts are free-response while others are multiple choice. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** We expect an average score of 70% or higher.		
Department - Mathematics (MATH) - MATH 48B - PRECALCULUS II - Function Analysis - A successful student will be able to graph, analyze and transform rational, exponential and logarithmic functions. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:**	**Assessment Method:** The students will be given a multiple choice question regarding transformations of a trigonometric function. **Assessment Method Type:** Exam - Standardized **Target for Success:**	12/16/2013 - Five of six sections in fall 2013 gave the students two common questions addressing this SLO in their final exams. 36% of the students got the first question correct, while 45% of the students got the second question correct. One section gave the students open-ended, free-response questions to address this SLO. 79% of	12/16/2013 - Meet to discuss expectations, assessment, and the use of technology in the classroom. Work to get embedded tutors in the precalculus classes.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Active	We are hoping that at least 50% of the students gets this problem correct.	the students from that section got the over 80% on the first question, while 95% of the students got over 80% on the second question. The two common questions did not require students to compute an answer; however, they were required to think critically about the graphs of exponential and logarithmic functions. No numeric values were given for the parameters of the functions, so the students needed to think more abstractly. The questions given in the one section required students to think about the graphs of rational and logarithmic functions. The students could check their answers with a graphing calculator. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Time for full-time and part-time faculty to discuss content, pedagogy, expectations, and assessment.	
	Assessment Method: We will give a multiple part free-response question asking students to analyze the graph of a rational function. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** We expect the average score on this question to be 70% or higher.		
Department - Mathematics (MATH) - MATH 48C - PRECALCULUS III - Modeling - A successful student will be able to model real-life phenomenon using linear, polynomial, trigonometric, exponential, logarithmic and rational functions, use the model to make predictions, and interpret solutions within the context of the real-life phenomenon.	**Assessment Method:** The students were asked to solve a problem containing multiple parts on the final exam. The format of the question was free-response and there were different point values assigned to each part of the question. **Assessment Method Type:**	04/14/2014 - The regression problem that was designed to assess this SLO worked beautifully for the instructors who created the prompt. As expected, over 70% of those students scored over 70% on this problem. However, the prompt did not work very well as an assessment of this SLO for other instructors. Two instructors could not justify putting it on their final exams due to their	04/14/2014 - Support to meet and discuss aspects of this class including curriculum topics, pedagogy, SLO's, and assessment techniques.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
(Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	Exam - Course Test/Quiz **Target for Success:** At least 70% of the students would receive a score of at least 70% on the problem. **Related Documents:** M48C_SLOs.doc	light coverage of this topic. The prompt was not well-suited to the final design of another instructor and yielded unusable data. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Support to meet and discuss aspects of this class including curriculum topics, pedagogy, SLO's, and assessment techniques. Embedded tutors. Intrusive counseling. **GE/IL-SLO Reflection:** This problem addresses critical thinking, computation and writing components of the GE/IL-SLO's. The students were given a set of data and had to determine which type of function best modeled the data set and justify their reasoning. Additionally, they had to use the model to compute interpolations.	04/14/2014 - Provide intrusive counseling. 04/14/2014 - Seek funding for embedded tutors.
	Assessment Method: Students were given a multiple choice problem on the final exam addressing this SLO. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of students answer the assessment correctly.		
	Assessment Method: A multiple choice question on the final exam was used to assess this SLO. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** AT least 70 % correct.		
	Assessment Method: A multiple part question will be given to assess this SLO. **Assessment Method Type:**		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	Exam - Course Test/Quiz **Target for Success:** At least 70% of the students should score at least 70% on this problem.		
Department - Mathematics (MATH) - MATH 48C - PRECALCULUS III - Vectors and Parametric equations - A successful student will be able to define, graph, and demonstrate appropriate applications of vectors and parametric equations. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** The students were asked to solve a problem containing multiple parts on the final exam. The format of the question was free-response and there were different point values assigned to each part of the question. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of the students would receive a score of at least 70% on the problem. **Related Documents:** M48C_SLOs.doc	04/14/2014 - The students scored an average of 57% - 66%, depending on the section. Students were close, but did not quite meet the target for this problem. The problem was one that involved parametric equations. The majority of the students could write the equations and solve one-step problems with the equations. However, as the problem got more complex and involved multiple steps to solve the problem, fewer students got it correct. This is to be expected. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Time for PT and FT instructors to get together to discuss stretegies for cultivating critical thinking skills. **GE/IL-SLO Reflection:** This problem involves critical thinking, computation and writing skills. The students were given a problem that involved parametric equations. They had to determine the equations that modeled the situation, compute values based on these equations. Lastly, they had to determine if a ball would reach a certain height given a certain horizontal distance. Solving the last part of the problem required multiple steps.	10/01/2014 - As part of our Equity work, request data on the presence of targeted groups in the precalculus courses. 04/14/2014 - Meet to discuss strategies for developing critical thinking skills in students, particularly multi-step problems. 04/14/2014 - Work to get resources--embedded tutors and intrusive counseling--to precalculus students.— (Precalculus, in 4-yr colleges, is considered remedial. However, at the community college, there isn't much focus and attention paid to these students because their mathematical skills are higher than those of basic skills courses.)
	Assessment Method: Students were given a multiple choice question on the final exam addressing this SLO. **Assessment Method Type:** Exam - Course Test/Quiz		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	Target for Success: At least 70% of students answered the assessment question correctly.		
	Assessment Method: A multiple choice question was used to assess this SLO. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70 % correct.		
	Assessment Method: The students will be given a multiple part question to assess this SLO. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of the students should score 70% or above.		
Department - Mathematics (MATH) - MATH 48C - PRECALCULUS III - Trigonometry - A successful student will be able to apply trigonometric functions, identities, and Laws of Sine and Cosine to solve applications problems. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** The students were given a multiple choice problem addressing this SLO on the final exam. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of the students will answer this question correctly. **Related Documents:** M48C_SLOs.doc		
	Assessment Method: The students were given a multiple choice question on the final exam addressing this SLO. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70% of students answered this correctly.		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	Assessment Method: A multiple choice questions was used to assess this SLO. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 70 % correct.		
	Assessment Method: Students were given a question that contained multiple parts. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** Over 70% of students scoring 70% or above.	04/14/2014 - Average scores ranged from 39% - 66%, depending on the section. This wide range of average scores warrants a discussion on curriculum, pedagogy, and assessment. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014 **Resource Request:** Time for PT and FT instructors to discuss curriculum, pedagogy, and assessment. Embedded tutors. Intrusive counseling. **GE/IL-SLO Reflection:** This question required critical thinking, computation skills. The students were given some information about sunspots which occur cyclically. They were asked to create a model that fit the information and compute values based on the model.	04/14/2014 - Strive to bring much needed resources—embedded tutors and intrusive counseling—to this vulnerable population. Meet to discuss assessment techniques. (See Action Plans for other SLO's)
Department - Mathematics (MATH) - MATH 54H - HONORS INSTITUTE SEMINAR IN MATHEMATICS - Using Appropriate sources of information - Analyze research questions posed by the instructor using appropriate sources of information. (Created By Department - Mathematics (MATH))	**Assessment Method:** The instructor will grade the students' research presentation based on a rubric to be included with the assessment findings. **Assessment Method Type:** Research Paper	10/06/2014 - This course was not offered in the 2013-2014 school year. **Result:** Target Not Met **Year This Assessment Occurred:** 2013-2014	
Department - Mathematics (MATH) - MATH 54H - HONORS INSTITUTE SEMINAR IN MATHEMATICS - Presenting answers - Present answers to the defined research	**Assessment Method:** The instructor will grade the students' research presentation based on a rubric to be included with the assessment findings.	10/06/2014 - This course was not offered in the 2013-2014 school year. **Result:** Target Not Met	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
questions orally or in writing using appropriate mathematical language (Created By Department - Mathematics (MATH))	**Assessment Method Type:** Presentation/Performance	**Year This Assessment Occurred:** 2013-2014	
Department - Mathematics (MATH) - MATH 57 - INTEGRATED STATISTICS II - Inferences - Successful students will be able to draw appropriate inferences from data in the presence of uncertainty. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** End of Academic Year **Start Date:** 09/23/2013 **End Date:** 06/27/2014 **Course-Level SLO Status:** Active	**Assessment Method:** All students were required to complete a culminating project (usually as part of a group) that required all of the following: formulation of research question, collection and analysis of data, and creation of a paper which documents all aspects of the study, including presentation of both the descriptive and inferential statistics as well as appropriate interpretations. **Assessment Method Type:** Class/Lab Project **Target for Success:** At least 80% of students will earn a grade of C or better on their project. (Although we would really like for 100% of the students to get a grade of C or better on this assignment, a goal of 80% is probably more realistic. **Related Documents:** Math 17 SLO reflections S2012.docx	10/10/2014 - 100% students did a quarter long project of their choosing and received a C or better. They designed observational studies, gathered data, organized data, constructed confidence intervals, ran a hypothesis test and presented the results to the class. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **GE/IL-SLO Reflection:** This is a culminating project using all four C's	
Department - Mathematics (MATH) - MATH 57 - INTEGRATED STATISTICS II - Using Models to Make Predictions - Successful students will be able to make predictions using linear and exponential models. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** Multiple Choice Questions #14,20,31,32 from Carnegie "End of Course Assessment" were used to assess this SLO. **Assessment Method Type:** Exam - Standardized **Target for Success:** 70% of students will get at least 3 of these 4 problems correct.	10/10/2014 - 85% of students got at least 3 of the 4 questions correct. The improvement was bases on a practice done in groups **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **GE/IL-SLO Reflection:** This activity requires both computational skill, communicational and analytical thinking.	
	Assessment Method: questions 6, 14, 20, and 31 on the carnegie		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	summative common assessment exam. **Target for Success:** 70% correct on these questions		
Department - Mathematics (MATH) - MATH 57 - INTEGRATED STATISTICS II - Hypothesis Testing - Successful students will be able to carry out and critically assess all steps in a hypothesis test, from the design of the study and the collection of data to the production of a report which summarizes the data and the statistical findings. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active	**Assessment Method:** All students were required to complete a culminating project (usually as part of a group) that required all of the following: formulation of research question, collection and analysis of data, and creation of a paper which documents all aspects of the study, including presentation of both the descriptive and inferential statistics as well as appropriate interpretations. **Assessment Method Type:** Class/Lab Project **Target for Success:** At least 80% of students will earn a grade of C or better on their project.	10/10/2014 - 100% of students completed and presented their quarter long projects **Result:** Target Met **Year This Assessment Occurred:** 2013-2014 **GE/IL-SLO Reflection:** This is a reflection of true community responsibility wherein the students chose to collect data on public issues. They used communication skills to present their findings to the class and their hypothesis test and confidence intervals required computational skills.	

Unit Assessment Report - Four Column

Foothill College

Program (PSME - MATH) - Mathematics AS

PL-SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Program (PSME - MATH) - Mathematics AS - 1 - Students completing their math program at Foothill College will be able to clearly communicate mathematical ideas through graphs, tables of data, equations, and verbal descriptions. **SLO Status:** Active	**Assessment Method:** Instructor-generated research assignment will be given in one of the Math 2A classes during the winter quarter of 2012. The assignment will be graded using a qualitative rubric. **Assessment Method Type:** Research Paper **Target:** 70% of the students will earn a "C" grade or better on the assignment. **Related Documents:** AS math P-SLO assessment prompt		
	Assessment Method: Comprehensive final exam given to students at the end of the course in the fall 2012 quarter **Assessment Method Type:** Exam - Standardized **Target:** 70% of the students will earn a "C" grade or better on the exam.		
	Assessment Method: At the end of the Winter Quarter in 2014, a problem with four questions was given part of the comprehensive Math2B final exam. **Assessment Method Type:** Exam - Course Test/Quiz **Target:** 70% of the students will earn a "C" grade or better on the problem.	04/25/2014 - Out of 34 students who took the final exam, 31 earned a “C” grade or better, which is a 91% success rate. The class average on the problem was 93%. The average on the entire final exam was 85%, and the average of the entire course was also 85%. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	04/25/2014 - The class started with 41 students, 2 of whom dropped and one withdrew. 4 of them didn’t take the final exam. Beside one student who had a medical issue in the middle of the quarter, it would be helpful to know what the other reasons for quitting the class were. Although most of them developed proper set notation, logic, reasoning skills, and proof techniques during this Math2B class which is one of the last math classes at Foothill, it

PL-SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
			would be nice if Math22 (Discrete Mathematics) were a recommended class for taking Math2B on Foothill Class Catalog.
Program (PSME - MATH) - Mathematics AS - 2 - Students completing their math program at Foothill College will be able to construct appropriate mathematical models of natural phenomena, develop those models with appropriate mathematical techniques, and interpret results of those models **SLO Status:** Active	**Assessment Method:** Common assessments given at the end of all terminal classes. These questions will be given to all sections of the course. **Assessment Method Type:** Departmental Questions **Target:** 70% Success.		
	Assessment Method: A subset of four problems tested on the final exam, which together require students construct a model of natural phenomena and then use the model to answer questions and interpret results will be used to assess this PL-SLO. **Assessment Method Type:** Exam - Standardized **Target:** An average score of 70% or higher on the 4-problem assessment		
	Assessment Method: At the end of the Winter Quarter in 2014, an application problem with five questions was given as part of the comprehensive Math2B final exam. **Assessment Method Type:** Exam - Course Test/Quiz **Target:** 70% of the students will earn a "C" grade or better on the exam.	04/25/2014 - Out of 34 students who took the final exam, 32 earned a “C” grade or better on the problem, which is a 94% success rate. The class average on the problem was 93%. The average on the entire final exam was 85%, and the average for the entire course was also 85%. **Result:** Target Met **Year This Assessment Occurred:** 2013-2014	04/25/2014 - With the students’ mathematical maturity in this level of math class, in addition to their ability to solve a mathematical modeling problem given, assigning them a creation of application problems requiring modeling and interpretation could be a great practice and a meaningful measurement of their conceptual understanding. That assessment

PL-SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
			can’t be done in a timed test, but is feasible in a project.