Annual MATHEMATICS Instructional Program Review Template for 2011-2012

Program Review at Foothill College

Purpose

An effective program review supports continuous quality improvement to enhance student learning outcomes and, ultimately, increase student achievement rates. Program review aims to be a sustainable process that reviews, discusses, and analyzes current practices. The purpose is to encourage program reflection, and to ensure that program planning is related to goals at the institutional and course levels.

Process

Foothill College academic programs that lead to an A.A./A.S. or Certificate(s), or are part of a specialized pathway, such as ESL, Developmental English, Math My Way are reviewed annually using this template, with an in-depth review occurring on a three-year cycle. The specialized pathways may be included as part of the program review for the department, or may be done as a separate document if they are not part of a department that offers a degree or certificate. Faculty and staff in contributing departments will participate in the process. Deans provide feedback upon completion of the template and will forward the program review on to the next stage of the process, including prioritization at the Vice Presidential level, and at OPC and PaRC.

Annual review will address five core areas, and include a place for comments for the faculty and the dean or director.

1. Data and trend analysis
2. Outcomes assessment
3. Program goals and rationale
4. Program resources and support
5. Program strengths/opportunities for improvement
6. Administrator's comments/reflection/next steps

Foothill College Program Review Cycle:

2011-2012 All academic programs participate in an annual program review

2012-2013 1/3 of academic programs participate in comprehensive review, remaining 2/3 of programs update their annual program review

Contact: Office of Instruction and Institutional Research, 650-949-7240

Instructions: Complete this template with data on any degree, certificate, or pathway your department offers. Return the completed form to your Dean on the last day of Fall quarter.

Website: http://foothill.edu/staff/irs/programplans/index.php

2011-2012 Submission Deadline:

All program review documents are due to Deans by December 16

Basic Program Information

Department Name: Mathematics

Program Mission(s):

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

It is our mission to provide every student the opportunity to pursue an outstanding math education, through a rigorous curriculum that will prepare students to succeed in courses at 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, and inquiry.

Program Review team:

Name	Department	Position
Jennifer Sinclair	Mathematics	Faculty
Rick Martinez	Mathematics	Faculty
Winnie Wong	Mathematics	Faculty
Debbie Lee	Mathematics	Faculty
Lori Silverman	Mathematics	Faculty
Patrick Morriss	Mathematics	Faculty
Marc Knobel	Mathematics	Faculty
Kathy Perino	Mathematics	Faculty
John Sawka	Mathematics	Faculty
Brian Stanley	Mathematics	Faculty
Marnie Francisco	Mathematics	Faculty
Sarah Delos Santos	Mathematics	Faculty
Phuong Lam	Mathematics	Faculty
Young Hee Park Lee	Mathematics	Faculty
Zach Cembellin	Mathematics	Faculty
Ion Georgiou	Mathematics	Faculty

Programs* covered by this review

Program Name	Program Type (A.S., C.A., Pathway, etc.)	Units**
Degree Program	A.A. or A.S.?	45
Transfer Program **Culminating class: Math 10 or Math 44 or Math 57** **Culminating class: Math 1C** **Culminating class: Math 12**	Pathway(s)	
Pre-collegiate Program **Math 230 (MathMyWay)** **Culminating class: Math 105/108**	Pathway(s)	

*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. For example, ESLL, Math My Way, etc. You will only need to address those data elements that apply.

**Certificates of 27 or more units must be state approved. If you have certificates that are 27 or more units that are not state approved, please indicate your progress on gaining state approval, with the tentative timeline for approval, or your plan for phasing out the certificate.

Section 1. Data and Trend Analysis (See Appendix A)

1.1 Program Data will be posted on: http://foothill.edu/staff/irs/programplans/programreviewdata.php for all measures except non-transcriptable completion. Please attach all applicable data sheets to the final Program Review document submitted to your Dean. You may use the boxes below to manually copy data if desired.

Transcriptable Program	2008-2009	2009-2010	2010-2011	% Change
See Appendix A				

Please provide any non-transcriptable completion data you have available.

Non-Transcriptable Program	2008-2009	2009-2010	2010-2011	% Change
See Appendix A				

1.2 Department Data

Dimension	2008-2009	2009-2010	2010-2011	% Change
Enrollment	8,273	9,268	9,533	3%
Productivity (Goal: 546)	608	651	660	1%
Success	5366 (65%)	5867 (63%)	5653 (59%)	
Full-time FTEF	12.3	10.9	11.2	3%
Part-time FTEF	14.3	16.5	16.6	0%
Full-time Staff				
Part-time Staff				

Department Course Data

	2008-2009			2009-2010			2010-2011		
Course	Enroll.	Prod.	Success	Enroll.	Prod.	Success	Enroll.	Prod.	Success
See App A									

1.3 Using the data and prompts, provide a short narrative analysis of the following indicators.

1. Enrollment trends over the last three years: Is the enrollment in your program holding steady, or is there a noticeable increase or decline? Please comment on the data and analyze the trends.

Overall, enrollment is increasing 3% year to year. Specifics by program are detailed below:

Math 10/44/57: Enrollment is up approximately 1% - 3% in Math 10 and Math 44. Math 57 is the final class in the Statway™ sequence and will be offered for the first time in Winter 2011.
Math 1C: There has been approx. 7-22% growth in the calculus series (Math 1ABC).
Although 1D enrollments were down from 2009-2010, they are still up 33% from 2008/2009 (The recent drop is probably due to the overall decrease we've seen in engineering students. De Anza had a similar decrease). The pathway (Math 51,49) that feeds into the calculus series saw

enrollment growth in Math 51 and decline in Math 49, probably due to the fact that the success rate has been decreasing in Math 51 (so fewer students can move on to Math 49). All the courses described above are taken by STEM or business/economics majors who want to transfer to a 4-year school.

Math 230 (Math My Way): Enrollment is constant (limited by facilities & faculty resources).

Math 105/108/220: Enrollment is increasing at approximately 5-8%.

Transfer Courses:
Enrollment in our major courses (calculus and above) has increased over the last couple of years (course by course, up 7% - 22% from 2090-10. And although 1D enrollment is down from 2009-10, it is, in fact, still up 33% from 2008-09. The pathway (Math 51,49) that feeds into the calculus series saw enrollment growth in Math 51 and decline in Math 49, probably due to the fact that the success rate has been decreasing in Math 51 (so fewer students can move on to Math 49). All the courses described above are taken by STEM or business/economics majors who want to transfer to a 4-year school.

Students in other majors who plan to transfer will typically (40.3%) take Math 10 or Math 44 to satisfy their GE Math requirement. Enrollments in these courses are increasing slowly. Math 10 enrollments were up 1% in 2010-11 from 2009-10. But they are up 13% from 2008-09. Math 44 was only offered once in 2011-12 to develop student interest.

The following table documents where students go after succeeding in Intermediate Algebra:

Next Course after Math 105 Success	Count	% of Total
Took Statistics (10) after Inter. Alg. (105)	973	40.3%
Took Trigonometry (51) after Inter. Alg. (105)	302	12.5%
Took Statistics & Trigonometry after Inter. Alg. (105)	197	8.2%
Directly into PreCalc (49) or Calc (1A) after Inter. Alg.	18	0.7%
Did not take Math after Inter. Alg. (105)	923	38.0%
Total	2,413	99.7%

* Four years of Inter. Alg. course success were used (2005-06 thru 2008-09), and were tracked forward for subsequent enrollments through Spring 2010.

So across the board, we are seeing increased demands on our courses used to support transfer.

Precollegiate Courses:
We also support the college mission of basic skills via Math My Way (MMW) and our algebra courses. Math My Way enrollment was stable from 2009-10 to 2010-11, but up from 2008-09. MMW is limited in enrollment due to the classroom resources and trained faculty requirements. Enrollments in both Math 220/21 and Math 105 are up (5%-8%) from 2009-10. Students who do not plan to transfer (38.0%) can use Math 105 as their last math class—such as for an A.S. degree in Allied Health . Unfortunately, as our enrollments have increased, our success rates have decreased. It is our theory that these success rates are decreasing primarily because of the following reasons: Students are not college ready (they regularly fail to allot enough time on task to their courses) and students are not doing the review that's necessary when time passes between courses in a sequence (thus deferring it to a weekly/daily basis, which increases the amount of time on task needed to be successful). Our faculty is discussing this trend via on-going discussion and is looking for ways to improve student performance in these courses.

2. Completion Rates (Has the number of degrees/certificates held steady, or increased or declined in the last three years? Please comment on the data and analyze the trends.

a. AA, AS, transcriptable certificates:

Our department awarded only 6 AS degrees last year. This is due to the high transfer rate among our students. The transfer students don't focus on their GE but on their core major courses, all with an eye on transferring to a 4 year school in a timely manner. They see no value in taking additional courses to get an AS degree.

b. Local, non-State approved certificates:

Not applicable.

c. Certificates less than 27 units: All certificates less than 27 units should be reviewed carefully to determine if the certificate provides a tangible occupational benefit to the student, such as a job or promotion or higher salary, and documentation should be attached.

Not applicable.

3. Productivity: The college productivity goal is 546. (Please analyze the productivity trends in your program and explain factors that affect your productivity, i.e. GE students, size restrictions)

Our AY Productivity was up 1% in 2010-11 from the prior year. At 660, we are well above the goal of 546. The main reason our productivity is so high is because faculty go above and beyond the call of duty by taking more than the course outline of record maximum students into their class sections. They do this to offset the decline in enrollment that tends to occur during the census period.

4. Course Offerings (Comment on the frequency, variety, demand, pre-requisites.) Review the enrollment trends by course. Are there particular courses that are not getting the enrollment or are regularly cancelled due to low enrollment?)

The courses that we discussed above that support transfer and basic skills are offered every quarter, via multiple sections. For this reason, there is no issue with frequency or prerequisites, except that we have to keep up with increasing demand. The exception is Math 44 (Math for Liberal Arts Majors) and Math 108 (accelerated algebra). We are watching these new classes to determine when and if we should offer additional sections.

5. Curriculum and SLOs

a. Comment on the currency of your curriculum, i.e. are all CORs reviewed for Title 5 compliance at least every three years and do all prerequisites, co-requisites and advisories undergo content review at that time? If not, what is your action plan for bringing your curriculum into compliance?

Our curriculum is in compliance with Title V. Within our department, each instructor "manages" one or more course, curriculum-wise. That instructor manages the SLO process as well as the update of the COR.

b. Comment on program mapping and how it ties to the college Mission(s).

Our programs are closely tied to the college missions. There are several course mappings that support transfer, summarized here:

Liberal Arts Transfer:	Math 10, Math 44, and maybe Math 217/57 (Statway™)
Economics/Biology Transfer:	Math 1A/1B/1C
Stem Transfer:	Math 2A/2B/1D

The second and third mappings, above, are supported by our new sequence (48A/B/C), and used to be supported by the sequence 51/49. While 48C (the culminating course) could be used to satisfy the GE math requirement at CSU and UC, in reality, most students taking 48A/B/C would take them in preparation for calculus.

There are several course mappings that support the acquisition of basic skills, summarized here:

Supports acquisition of basic skills and AA/AS degree as well as progression to transfer level:

230(MathMyWay)/220/105 or 108 or 217/57(Statway™)

Besides serving Transfer, GE, Degree, and Basic Skills needs, math is a supporting topic/prerequisite for many related majors, such as sciences, business, and engineering, as well as for students applying to graduate school.

c. Identify any other programs with which your program has overlap, and comment on the purpose of the overlap.

We have a synergistic relationship with the adaptive learning division. Theresa Ong from adaptive learning has a mathematics background which qualifies her to teach noncredit math classes. She also is uniquely qualified to address the needs of many of

the students who need to study basic math. So we are fortunate to be able to assign her to teach NCBS 401 (basic arithmetic).

CIS 18 and Math 22 (computer science – discrete math) are cross listed and represent the same class. It is cross-listed because it is generally computer science majors who need it, but always math instructors who teach it. Interestingly, some students need it to show up as a CIS class on their transcript while others need it to show up at a Math class. So the cross-listing is beneficial to the students.

d. Comment on any recent developments in your discipline which might require modification of existing curriculum and/or the development of new curriculum?

Data collected for the Carnegie Foundation indicates that only 7% of FHC students who place into developmental math complete a college level math class within 2 years. We know that many students who take placement tests are not committed to a particular goal at Foothill College. They may be "fishing" for a better placement than they got at another college or they may just want to take a particular class here. There is also a shift in student demographics and an increase in student course load which probably have a negative impact on student success rates. Some researchers believe that many students are deterred by the lack of variety in math offerings. We don't know if this is the case, but we are exploring an alternative pathway via the Statway™ Project. This pathway takes students who qualify for Math 220 and starts teaching them statistics, providing math/algebra support via a "just in time" approach. The students study as a cohort for two consecutive quarters, earning 10 basic skills units during the first quarter and 5 GE math (FH & CSU) units upon completion of the second course. The focus is different than that in our traditional statistics class (which has Math 105 as a prerequisite). And the UC system is undecided about whether they will grant college level math credit. This program is brand new, so we do not have any data on it yet.

Another alternative pathway that we are trying is Math 108, in which a student will study both beginning and intermediate algebra in a single quarter. The course is modeled after and based on the "bootcamp" concept. This would be a great option for strong students who are already familiar with beginning and intermediate algebra but who want an intense review of algebra before diving into statistics or college algebra. Unfortunately, these students do not generally opt to take the time for a refresher course. Instead, this new class (offered for the first time in 2010-11) seemed to have a lot of the weakest students (presumably because these students wanted whatever option would get them through their math most quickly). This course had lower than average success rates. We plan to offer it again, with increased counseling to the students. We would especially like to get our target group into that class—students who need an algebra refresher to ensure improved performance in College Algebra (trigonometry/precalculus). A lot of thought went into the decision to offer this new course. And we believe it deserves further "tries." Research has shown that students are more successful at completing their academic pathways if there are fewer exit and re-entry points. (We lose students when they are unable to pass a class. And then programs lose even the passing students because they don't return to register for the subsequent class. Math 108 cuts out one of these exit/re-entry points. There is additional research supporting more focused, single subject study. Students who juggle too many different courses have a harder time succeeding than those who only have to juggle one intense course. Math 108 is almost a full

load (10 units), allowing the students to focus intensely for the quarter. There is a third reason that we developed Math 108. Math 220 and Math 105 have many overlapping concepts. For example, factoring and exponent properties are covered in both courses. In Math 108, there is no need for this repetition of topics. Therefore, there is more time for in-depth study of the concepts. There is a lot of talk about "teaching deep" rather than "teaching narrow." Math 108 gives us the opportunity to teach more deeply. Finally, Math 108 allows students to reach the end of their math pathway in one less quarter than our traditional 2-course route.

Another new pathway that we are implementing this year is our New 48A/B/C series. Since 2008, we have seen a steady decline in the success rates for Math 51, Trigonometry and Math 1A, Calculus I. Additionally, the math faculty have reported insufficient time to cover topics in depth for both the Math 51 and Math 49, Pre-Calculus classes. For these reasons, the math faculty decided to create the M48 sequence, which covers the topics in Math 51 and Math 49 and several other topics in a span of 3 quarters. Our intended goals are as follows:

• Prior to Math 48, students went from Math 105 to Math 51 to Math 49 to Math 1A. This transition could be hard on the students since the topics did not flow from one course to the next. With the creation of the Math 48 sequence, the order of topics covered has been changed so that subsequent courses build on the topics covered from the previous courses. It is our hope that students will have a smoother transition from Math 105 to Math 1A and that this would be reflected in an increase in the proportion of students who take Math 1A after starting in Math 48A, and also in an increase in the success rates of Math 1A.

• The Math 51/49 sequence was a 2-quarter sequence. We are aware that increasing sequence duration goes against the research sited above. However, we have many reasons to try this new curriculum. Math faculty felt that the 51/49 sequence did not allow time for in-depth coverage of topics and that students gained superficial knowledge, but not much mathematical insight. Almost 50% of all Math 51 students place into the course rather than coming from Math 105. We analyzed the cut scores for the Math 51 students and discovered that correct placement is very difficult (IR Johnstone June 2010). Having three levels will assist in placing students correctly. The same was observed in Math 49 placement. The goal is this: By extending the sequence from 2 quarters to 3 quarters, and having the trigonometic functions in the 2nd & 3rd quarters, students will be given more time to delve more deeply into topics and to develop the mathematical maturity needed to handle calculus.

• The math faculty also reported that students did not have sufficient knowledge of trigonometry upon entry into Math 1A. Prior to the Math 48 sequence, students could place into Math 49 without much knowledge of trigonometry. Math 49 did not contain any trigonometry. By placing trigonometry into the latter portions of the Math 48 sequence, the students will be exposed to topics in trigonometry before entering calculus.

This is a brand new series and we do not yet have data on it.

As enrollments increase, we notice that we are getting more students who suffer from overscheduling as well as from significant gaps in their mathematical preparation. At the college level this is reflected in the IR report "FH_Ave_Attempt_Earnered_Trend.pdf" attached

in the appendix. Many of us are amazed that our calculus students cannot identify and apply the appropriate algebra to calculus problems. Without changing any courses or pedagogical practices in the classroom we decided that offering workshops could help some students succeed. We hope the workshops ("Booster Classes") will fill in some knowledge gaps and provide students some time on task. We based our model on the SJSU NSF grant calculus workshops, which have been very successful in raising their success rates. In the workshops that we observed at SJSU, the students are required to attend the workshops (though the students can opt-out but they have to physically go to the math department to make such a request). Our workshops are currently optional. This is a new endeavor and we do not yet have any data regarding its use.

e. Do all of the courses in your program have SLOs identified? Do all programs have program-level student learning outcomes? If not, what is your plan for completing these?

All of our current courses have SLOs identified.
We have identified department-wide program-level SLO's that can be applied to all programs/pathways in our department.

6. Basic Skills Programs (Please describe your Program's connection to this core mission, if applicable):

Via our Math My Way, Math 220/221, and Statway™, we provide avenues for students to develop their Basic Skills in Mathematics. Our enrollment in Basic Skills classes during 2010-2011 was 2122 (out of a total enrollment of 9,533). So approximately 22% of our enrollment was in Basic Skills classes.

7. Transfer Programs: Articulation (Please describe your Program's connection to this core mission, if applicable)

The majority of our courses support Transfer. See 5b, above.
Math 105 and Math 108 may be terminal classes for students striving for an AA or Certificate. Or they may serve as prerequisites for transferable math classes. Enrollment in these classes during 2010-2011 was 1344 (out of a total enrollment of 9,533). So approximately 14% of our enrollment was in these classes.

Our enrollment in classes "above Math 105/108 (algebra)" was 6038 (out of a total enrollment of 9,533). So approximately 63% of our enrollment was in classes beyond algebra.

So depending on the goals of those taking algebra, somewhere between 63% and 77% of our enrollment is in classes that we believe students are taking for transfer reasons. Additionally, many of the students enrolled in Basic Skills classes may also plan to eventually transfer. So part of that enrollment may also be in support of transfer.

8. CTE Programs: Labor/Industry Alignment (Please describe your Program's connection to this core mission, if applicable)

It is difficult for us to determine the proportion of our enrollment that is pursuing CTE Programs. Students who are getting certificates and A.A. degrees may view Math 105/108 as their "terminal" math class. Students in our classes may be pursuing a change in career. Although we believe that part of our enrollment is related to CTE Programs or student plans to change their career or improve their professional skills, we have a limited ability to quantify this. Generally, we feel that the % of our enrollment attributable to such plans is much smaller than the % of enrollment attributable to Basic Skills or Transfer pursuits. During 2005-2009, we found that 38% of the students who succeed in Math 105 do not continue in math at Foothill College. These students may be involved in CTE Programs, earning Associates degrees either from Foothill College or from another school in the state. In 2010/11, it looks like 655 of our enrollment numbers in 105/108 passed. 38% of 655 is about 249, which is about 2.6% of our enrollment.

Section 2. Learning Outcomes Assessment Summary

2.1. Attach 2010-2011 Program Level – Four Column Report for PL-SLO Assessment from TracDat, please contact the Office of Instruction to assist you with this step if needed.

Unit Assessment Report - Four Column

Foothill College

Program (PSME - MATH) - Mathematics AS

PL-SLOs	Means of Assessment & Target / Tasks	Assessment Findings	Action & Follow-Up
Program (PSME - MATH) - Mathematics AS - 1 - Students completing the math program (A.S. degree) at Foothill College will be able to clearly communicate mathematical ideas through graphs, tables of data, equations, and verbal descriptions. **PL-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	12/04/2011 - No Assessments given as of Fall 2011, so the target can't be classified as being met or not met. **Result:** Target Met **Year This Assessment Occurred:** 2011-2012	
Program (PSME - MATH) - Mathematics AS - 2 - Students completing the math program (A.S. degree) 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 **PL-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.	12/04/2011 - No Assessments given as of Fall 2011, so the target can't be classified as being met or not met. **Result:** Target Met **Year This Assessment Occurred:** 2011-2012	

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2.2 Attach 2010-2011 Course-Level – Four Column Report for CL-SLO Assessment from TracDat

(See AppendixB.pdf file attached)

Section 2 Continued: SLO Assessment and Reflection

2.3 Please provide observations and reflection below.

2.3.a Course-Level SLO

What findings can be gathered from the Course Level Assessments?

There is evidence of what we have all observed in our classes. The students that we see need substantial help with what we view to be prerequisite materials. This is not new information for us. It has been evident for a long time that students need increasing guidance and assistance to succeed in our classes.

What curricular changes or review do the data suggest in order for students to be more successful in completing the program?

This varies from class to class. We are somewhat limited in our flexibility with curriculum, due to the fact that so much of our curriculum serves transfer. The department has been actively testing out curriculum changes. We feel that we need to continue to do this. We also feel that we need to have greater feedback regarding the long-term benefits of our efforts/changes. We would especially like to know how students using a new curriculum perform in subsequent courses.

How well do the CL-SLOs reflect the knowledge, skills, and abilities students need in order to succeed in this program?

Last year, we were working with a model of SLO's that we have since scrapped. There were several issues with this model that we will describe here. First of all, we used the course objectives from our CORs as our SLO's. Taken together, all of these objectives do a pretty good job of reflecting the knowledge, skills, and abilities students need in order to succeed in our math program(s). However, it seemed unwieldy to assess and reflect on every one of these objectives. So we followed the guidelines of assessing 2 – 3 SLO's per year in every class. Taken individually or a few at a time, our objectives did not reflect the knowledge, skills, and abilities students need in order to succeed in this program. We appreciated the attempts within our department to communicate, collaborate, and reflect. However, the process sometimes felt hollow. We have altered all of our SLO's for this upcoming year to be more "global" representations of the courses. We are hopeful that the assessments that we use will prove more satisfying in terms of reflecting the knowledge, skills, and abilities students need to be successful.

How has assessment of course-level student learning outcomes led to improvement in student learning in the program?

As part of their SLO reflections, one instructor wrote, "When students are not well equipped with the concept of function and function notation in the PreCalculus course, they will struggle in Calculus class. It is necessary for the students with weak foundations from the prerequisite to have extra support from outside of the regular class." This sort of reflection has led to the development of our Math 48 series as well as the development of our Calculus Workshops. We would like to develop a testing center that faculty can send students to, which would assist the students in need throughout the department.

2.3.b Program-Level SLO

What summative findings can be gathered from the Program Level Assessments?

We have not yet made any Program-Level Assessments

How has assessment of program-level student learning outcomes led to certificate/degree program improvements?

We have not yet made any Program-Level Assessments.

2.4 Annual Action Plan and Summary: Using the information above, list the program's action steps, the related Core Mission objective, SLO assessment data and the expected impact on student success.

Action Step	Related SLO assessment (Note applicable data)	Related ESMP Core Mission Goals (Basic Skills, Transfer, Work Force, Stewardship of Resources)	How will this action improve student learning/success?
1 Create Readiness Exams for appropriate courses. And develop a plan for implementation.	Math 1A SLO Reflection 2010/2011 When students are not well equipped with the concept of function and function notation in PreCalculus, they will struggle in Calculus. It would be necessary for the students with a weak foundation in the prerequisite material to have extra support outside of regular class. A testing center that faculty can send students to, would assist the students in need throughout the department.	Transfer, Basic Skills Work Force	This action will provide students with the early feedback that they need to be successful. They could then choose to either drop into a lower level class or remediate while staying in given course. In this way, it would help ensure more appropriate placement into classes.

2 Create Booster classes/materials for appropriate courses	Same as Action Step 1. Math 230 SLO Reflections (1/11/11) We would like to receive funding to create and film some video presentation (mini-lectures) that would be accessible to students on demand.	Transfer, Basic Skills Work Force	Many of our students are weak in previously acquired skills. We don't have enough class time to reteach every skill they need. This action will allow students to remediate weaknesses while staying in given course.
3 Create Gateway Exams for appropriate courses.	Same as Action Step 1	Transfer, Basic Skills Work Force	Gateway Exams support mastery of important mechanics.
4 Develop a plan for administration of Gateway Exams.	Same as Action Step 1	Transfer, Basic Skills Work Force	Gateway Exams support mastery of important mechanics.
5 Arrange for department-wide professional discourse via Flex Days and workshops	Math 2B A lot more time and cooperative work are needed to have discussions with other colleagues on making a meaningful set of SLO assessment problems, sharing each other's different teaching strategies, gathering and analyzing the data, discussing about the data and sharing ideas with each other. Math 1D SLO Reflections (12/12/10) These reflections would suggest a need for resources to be put into faculty training/pedagogy and time to meet and discuss what's going on in our classes. There was a low percentage of student participation. Seven sections were asked to participate in this assessment but only 70 students completed the SLO assessment. More student participation would be needed for the future. This might be possible through faculty	Transfer Work Force Basic Skills	We are a very busy and productive faculty group. But we need more time to discuss and reflect on our efforts. This has been identified as an important step in the SLO process to support student success. We would like to continue this conversation throughout the year.

	training and more emphasis from faculty for participation. Math 105 SLO Reflections (6/29/11) A revision of the entire math 105 curriculum is being discussed in the 2010-11 school year. The revision of the curriculum is based on many factors, not just this SLO and assessment Math 1D SLO Reflections (12/12/10) More time would be needed to grade SLO assessment questions in the type of 'show-your-work' problems if the type of the assessment were changed. Same as Item 1.		
6. Coordinate with Institutional Research to create sequence of reports that can provide student tracking from course to course in a sequence each quarter.		Transfer Work Force Basic Skills	As changes are made in a course sequence we can track students skills and identify what changes within course sequences are effective.

Section 3: Program Goals and Rationale

Program goals should be broad issues and concerns that incorporate some sort of measurable action and should connect to Foothill's core missions, *Educational & Strategic Master Plan* (ESMP), the division plan, and SLOs.

3.1 Program relation to college mission/core missions

MathMyWay supports basic skills
PrecollegiateProgram supports basic skills, transfer, and workforce development.
Transfer Program supports transfer

3.2 Previous Program Goals from last academic year

Goal	Original Timeline	Actions Taken	Status/Modifications
1 Increase student success and improve teaching consistency.		New courses: Math 108 created. Math 48A/B/C created Math 217/57 created More peer tutors hired for Pass the Torch, using Basic Skills money. Part-time mentoring provided via .222 reassign time. This provides class observations, feedback, sample exams/quizzes, review of exams/quizzes. Booster class created for Math 1A.	Actions taken are listed to the left. We plan to continue the work that we've started. The new courses will be revised based on our experiences in the classroom. We would now like to work on development of readiness tests, Booster courses/materials, and development of Gateway exams. A group has already started to implement a booster class for Math 1A. Next will be a booster class for Math 105. We are pleased with the increase in peer tutors for Pass the Torch and in our mentoring program for Part-Time instructors. We want to fund this important work again next year.

2 Update SLO's	Short-term	We recently developed a SHORT list of SLO's for each course. Previously, we had used our course objectives as SLO's. Instructors have stepped up to "own" a class. So every active class now has new SLO's in TracDat. We are working hard to align more closely our departmental endeavors and the SLO process.	We have entered our SLO's in TracDat. We plan to refine them once they have been evaluated. We have set up a mechanism (DropBox) within our department for sharing and discussing SLO's.
3 Promote interest in the field of STEM education	Ongoing	Amanda Norick (Chemistry) ran a class which gave students the opportunity to explore a possible career in teaching STEM. The math department hosted their 2nd annual "Let's Play Math" event.	We are planning to continue both of these programs this next year.
4 Develop Web Page templates that all faculty can use	On-going	GoogleDocs has been explored/used by department. DropBox has been explored/used by department.	Technology has advanced so quickly in the last year, that our original goal has become obsolete. While it used to be difficult for faculty to make web pages, it is now very easy using such resources as Google Sites. We would like to research website editors that faculty can use to easily and quickly create websites.

3.3 New Goals: Goals can be multi-year

Goal	Timeline (long/short-term)	Supporting Action Steps from section 2.4 (if applicable)	How will this goal improve student success or respond to other key college initiatives
1 Improve teaching consistency among instructors	Long-term, continued	Action Steps 1-4	See 2.4, above
2 Develop course by course collection of teaching resources.	Long term	Action Steps 1-4	See 2.4, above
3 Develop the means to track students across courses	Ongoing would be nice	Action Step 6	This would provide us with better data with which to make decisions about the effectiveness of curriculum changes.
4 Develop and nurture an ongoing conversation about pedagogy.	Ongoing would be nice	Action Step 5	See 2.4, above
5 Develop the PSME Center into a faculty resource to support student success.	Long term	Action Steps 1-4	See 2.4, above

Section 4: Program Resources and Support

4.1 Using the tables below, summarize your program's resource requests.

Full Time Faculty and/or Staff Positions

Position	$ Amount	Related Goal from Table in section 3.3	Possible funding sources (Lottery, Measure C, Basic Skills, Perkins, etc.)
1 Full Time Faculty for PSME CTR	$100,000	1 & 2	A- Budget
Graduate Students for PSME CTR	$35,000	1 and 2	B Budget + Perkins + Basic Skills

Reassigned Time

Position	$ Amount	Related Goal from Table in section 3.3	Possible funding sources (Lottery, Measure C, Basic Skills, Perkins, etc.)
.222 Mentoring and .222 Scheduling		1, 2, and 4	A Budget or B Budget
.333 Pass The Torch		1, 2, and 4	FTEF assigned to PSME course PSE-111 and supported by high productivity in the department.

B Budget Augmentation

B Budget FOAP	$ Amount	Related Goal from Table in section 3.3	Possible funding sources (Lottery, Measure C, Basic Skills, Perkins, etc.)
TA's and Scanners for Basic Skills, Pre-collegiate, and transfer Programs	$55,000	1, 2, and 4	Basic Skills and B-Budget
Software Licensing	???		
Let's Play Math	$1,000	Continuing Goal – Promoting interest in STEM	B-Budget
Funding for Math Club members to hire speakers or attend colloquiums	$500	Continuing Goal – Promoting interest in STEM	B-Budget

Facilities and Equipment

Facilities/Equipment Description	$ Amount	Related Goal from Table in section 3.3	Possible funding sources (Lottery, Measure C, Basic Skills, Perkins, etc.)
Tablet PC's/iPads for classroom use in PSEC. Eventually, this may need new display systems.	190,000	1, 2, and 4	Measure C

One-time/Other: (Release time, training, etc.?

Description	$ Amount	Related Goal from Table in section 3.3	Possible funding sources (Lottery, Measure C, Basic Skills, Perkins, etc.)
Software/Technology training for FT + PT faculty	$2,000		Professional Development
Flex Day Retreat	$500	4 and 5	B-Budget
Stipends for Acceleration of Action Steps/Course Development	$8,000	1, 2, and 4	B-Budget
Stipend to support/development of internal math placement tests	$10,000	1, 2, and 4	B-Budget, Basic Skills
Stipend to support development of short videos (captioned) that students could access.	$2,000	1, 2, and 4	B-Budget, Basic Skills

Section 5: Program Strengths/Opportunities for Improvement

5.1 Use the matrix provided below and, reflect on the program relative to students' needs, briefly analyze the program's strengths and weaknesses and identify opportunities and challenges to the program. Consider external and internal factors, such as demographic, economic, educational, and societal trends. Some considerations may include current and future demand for the program, similar programs at other comparable institutions, and potential auxiliary funding.

	INTERNAL FACTORS	EXTERNAL FACTORS
Strengths	Fulltime faculty have shown considerable innovation in offering new math curriculum, attempting to open avenues to student success. Program supports a wide variety of academic programs across campus. As a group, we are very collegial.	Since Foothill is on the quarter system, our late start in the fall allows us to offer program opportunities to students who may have been shut out of the semester schools. We have excellent articulation agreements with UC schools, where many of our students want to transfer. "If you want to go to UC, go to Foothill."
Weaknesses	Program's student success rates are still lower than almost every other program on campus, in spite of significant and ongoing faculty efforts to offer curriculum and pedagogy that enables student success.	Time and technology available to make pedagogical advances. The program has been unable to make headway in increasing the proportion of course sections taught by full-time instructors, currently about 50%. We often feel as though there aren't enough Full-Time hands to share all of the Full-Time work duties. This limits what we are able to accomplish.
Opportunities	As of this writing, the college has approved the hiring of two new full-time math instructors, to begin Fall 2012, which can at least partially address the full-time course ratio. Provided we can keep our energy up, we have the opportunity to make great strides through work on our action steps. The Math Dept has a proposal submitted to NSF to provide partial funding for STEMway to address student lack of math preparedness.	In the current statewide climate, community colleges are being looked to more and more to help students focus on their general education. This program offers curriculum supporting general education math, positioning it well as community colleges embrace that shift in focus. We have many opportunities through our work with The Carnegie Foundation and Gates Foundation. (For example, professional development, curriculum development, and collaboration with colleagues--across the nation and as close as San Jose State.)
Threats	It is conceivable that we could get worn out before our goals are met. Without funding for new innovative curriculum development, the math success rates will probably remain the same.	Higher education funding is being further reduced statewide.

5.2 Are there any critical issues you expect to face in the coming year? How will you address those challenges?

The coming year will be critical in finding long-term funding for the PSME center. The move in the works to utilize non-credit instruction may be critical in bringing about this much-needed stability.

5.3 What statements of concern have been raised in the course of conducting the program review by faculty, administrators, students, or by any member of the program review team regarding overall program viability?

Nearly every academic program on campus demands something from the math program. Since math is a necessary part of general education and of many majors, there are no real concerns about the math program's viability.

5.4 Address the concerns or recommendations that were made in prior program review cycles.

See 3.2, above. We feel that our prior concerns have been addressed throughout this report and it would be redundant to recap here.

5.5 After reviewing the data, what strengths or positive trends would you like to highlight about your program?

Faculty have shown, and continue to show, willingness to develop and offer innovative curriculum and pedagogy. Recent negative trends in student success rates are prompting thoughtful reflection among program faculty, and will no doubt lead to further innovation.

Section 6: Feedback and Follow Up

This section is for the Dean to provide feedback.

6.1 Strengths and successes of the program as evidenced by the data and analysis:
The main strength of the Math Programs is the Faculty's math teaching skills with the goal to have all the students succeed. The other strengths are:

1. Programs have shown continuous growth in new curriculum as well as student enrollment.
2. The faculty are very collegial and work together in a very Democratic manner.
3. The FT Faculty work very hard to maintain their teaching skills and regularly update their courses to keep the materials fresh.
4. Their professionalism is reflected in taking on additional tasks such as working in the PSME Center, holding the annual math show for K-6 students, managing & overseeing the two annual national math competitions (AMATYC and Putnam), serving as advisers for the math club, leading the PSME division technology group and curriculum, and working on proposals for external funding.

The success of the math department is demonstrated in a number of different ways:

1. The Math My Way program has received national recognition and shown improvements far superior to other programs. Even though faculty could rest on their laurels, they are

continually changing and improving how the course is taught. This is partially due to the change in demographics in the basic skills program.

2. Kathy Perino was invited to participate in a Gates funded program referred to as GSCC. Nicole Gray and Rachel Mudge have been funded by the Carnegie foundation for education to help develop 2 new innovative math programs, Quantway and Statway. Young Hee Park Lee has been invited to speak to math students in South Korea.
3. The creation of the new math 48 A/B/C required the analysis of student success, placement, as well as math concepts covered. The faculty identified new Accuplacer cut scores so students could be more successful when taking their 1st math course. This required not just arranging the content in a new way but actually development of new pedagogy, testing, support and online materials for the full-time and part-time math faculty.
4. Foothill's math department was selected to be one of the 5 community colleges in California to participate in Statway. The program is a revolutionary change for students in basic skills math to complete a college level math course in 2 quarters.
5. The faculty have been campus leaders in the use of new technology to benefit their students. This has included the use of online materials such as Kahn Academy, tablet computers to permit lectures to be more interactive, investigation of learning management systems (LMS) that can be used across a sequence of courses, the use of online math applications in the classroom, and math skills assessment systems.
6. The Faculty continue to introduce new pedagogy as well as courses to meet students' needs. This includes:
    a. Math 108, an accelerated Algebra course based on researching alternate approaches.
    b. Math 44, an alternative to statistics (Math 10) where students develop decision-making skills.
    c. Math 48A/B/C redesign of Math 51 & Math 49.
    d. NCBS 405 course to provide PSME students learning support.
    e. NCBS 401 A/B noncredit course to address student's skills that are at the arithmetic level.
    f. Revamp of MathMyWay to reduce student book costs as well as reduce time to success.

In summary the math department has been very successful at multiple levels and I anticipate this will continue with adequate funding and college support.

6.2 Areas of concern, if any:

There are number of areas of concern:

1. The decline in student success in the math sequences is a major concern. Two major factors appear to be that students are 1) ill prepared in math fundamentals and 2) being college ready. The placement testing does not provide an adequate level of discrimination in core math concepts a student requires to be successful. The Math 1A students taking a commercial test called "MyMathTest" validated this in the fall quarter. A large number of the students were missing basic algebraic skills that should have been learned as a sophomore in high school. The 2nd factor is the student's lack of College Readiness. This is reflected in student's unwillingness to do homework or any activities outside of the classroom. There has also been a shift in the last 2 years in students

withdrawing (W) from a class prior to the 8th week so they would not get a grade less then they "A". These students are often the ones that are taking too many credits during the college quarter. With Foothill College's demographics shifting towards high school districts that have a history of under preparing their students to be successful in math, there will be new pressure to remediate the students at the same time they are taking core courses.

2. The next concern is how to best identify students' skills, provide them remediation, and have them actively participate in their success, while they take their current course load. There has been a lot of research in this area and the most prevalent approach is the booster classes in parallel with the main class. The weakness in the current approach that was piloted in Math 1A in 2011 fall is that students that required remediation didn't take advantage of the free booster classes.
3. Another concern is that the community college population is composed of many students that have a large number of issues outside of college. Based on recent feedback from math faculty participating in the GSCC Grant, achieving success rate above 78% is very difficult.
4. The next concern is providing the math faculty adequate time outside of the classroom to be innovative, do research in math pedagogy, and develop completely new math courses to meet the demands of today's students.
5. The last concern is the professional development for the full-time faculty but more importantly the part-time faculty in the use of technology, common standards for student success in a course as well as a sequence, and new teaching techniques and methodology identified in working with outside programs such as Gates foundation and Carnegie foundation.
6. The continued funding of the PSME Center to include the "Boot Camps" to provide remedial assistance.
7. Lack of FT Faculty and classroom space to accommodate the expansion of precollegiate and preparation for transfer level courses.

6.3 Recommendations for improvement:

There are always areas for improvement in education and math has been a popular topic. The recommendations are tied to the 6.2 Concerns list.

1. 6.2.1 Decline:
    a. The Math faculty have scheduled an all day meeting in February 2012 to discuss the decline in student success.
    b. Identify a list of potential changes to curriculum as well as math skills assessment and remediation.
    c. Institutional research has shown students that are placed into a math level without the Accuplacer test do worse than those that take the test. Discuss with Student Services to develop an integrated approach.
2. 6.2.2 Student's Skills:
    a. Identify a FH Math Tool to assess students math preparedness
    b. Identify approaches for remediation
    c. Develop a department level approach
    d. Present a plan to PARC
3. 6.2.3 Student Outside Demands:

   a. Provide precollegiate math students financial "support package"
   b. Develop special contracts based on course success and levels of participation in Pass the Torch and/or Booster classes
   c. Students take accelerated classes such as Math 235/230, Math 217/57 or Math 108.
4. 6.2.4 Faculty Time:
   a. Provide 1 quarter (1 qtr or over 3 qtrs) reassign time based on agreed upon projects
   b. Use external funds such as grants and Foundation funds when possible
5. 6.2.5 Professional Development:
   a. Invite math "experts" for lectures or 1 quarter visiting professor
   b. Develop quarterly ½ day seminars for FT & PT
      i. Pay PT $100 stipend
   c. Provide FT faculty reassign time to collaborate with local colleges (Stanford, UCSC) and Foundations (Gates, Carnegie, Packard).
      i. Use external funds such as grants and Foundation funds when possible
      ii. Contact Colleges and College Foundations.
   d. With 3 FT Math Faculty at Carnegie, when they return to FH provide a pathway to incorporate their experiences in current math courses.
6. 6.2.6 PSME Center:
   a. The Center requires a FT Faculty to develop new curriculum and provide coordination between Math Classes with Center support.
   b. Additional Graduate Student staff required supporting start of quarter assessments as well as remedial/booster class support.
   c. Identify and fund a publisher independent LMS for centralized course materials, assessments, homework and student tracking from course to course.
7. 6.2.7 Expansion:
   a. If FH is to reach a goal of 25% Latino as well as continue to attract students from outside FH's CCD, the basic skills (precollegiate) courses (Math 235/230, Math 108, Math 220/105, Math 217/57) will potentially at least double in sections offered. These rooms are at a premium as the math courses compete with each other as well as with Computer Science (CS) courses. It is envisioned the CS will increase in 2012-13 and double in 2013-14. Many of the basic skills courses are 10 hours per week (2 hours per day) and use both FT faculty load as well as rooms.
   b. The basic skills courses require classroom with access to computers/groupwork/paperwork as well as faculty trained in the course materials. The courses should be taught in a "Team Environment." This requires FT Faculty dedicated to the classes to provide the additional oversight and coordination.
   c. For every two new sections of a basic skills courses offered a FT faculty needs to be assigned.

6.4 Recommended Next steps:

_X__ Proceed as planned on program review schedule

___ Further review/Out of cycle in-depth review

APPENDIX A PROGRAM REVIEW DATA – PSME – MATHEMATICS (11/09/11)

Enrollment Trends

	FH			
	2008-09	2009-10	2010-11	Chg 09-10 to 10-11
Enrollment	8,273	9,268	9,533	3%
WSCH	50,971	56,181	53,817	-4%
FTES	1,133	1,249	1,196	-4%
AY_WSCH	42,246	47,569	49,697	4%
AY_FTEF	23.2	24.3	25.1	3%
AY_Productivity	608	651	660	1%

Full and Part Time Faculty Load

	FH			
	2008-09	2009-10	2010-11	Chg 09-10 to 10-11
Fulltime Load	12.3	10.9	11.2	3%
Fulltime Percent	46%	40%	40%	1%
Parttime/OL Load	14.3	16.5	16.6	0%
Parttime/OL Percent	54%	60%	60%	-1%

Course Success

	FH					
	2008-09		2009-10		2010-11	
	Enr	Percent	Enr	Percent	Enr	Percent
Pass	5366	65%	5867	63%	5653	59%
Did Not Pass	1900	23%	2150	23%	2413	25%
Withdrew	1007	12%	1251	13%	1467	15%
Total	8273	100%	9268	100%	9533	100%

Ethnicity

	FH					
	2008-09		2009-10		2010-11	
	Enr	Percent	Enr	Percent	Enr	Percent
Targeted Groups	1,909	23%	1,816	20%	1,835	19%
Not Targeted	6,364	77%	7,452	80%	7,698	81%
Total	8,273	100%	9,268	100%	9,533	100%

Course Enrollment Trends

		FH			
		2008-09	2009-10	2010-11	Chg 09-10 to 10-11
MATHF001A	Enrollment	740	861	925	7%
	AY_Productivity	635	625	663	6%
MATHF001B	Enrollment	549	642	685	7%
	AY_Productivity	564	630	588	-7%
MATHF001C	Enrollment	331	367	418	14%
	AY_Productivity	531	598	573	-4%
MATHF001D	Enrollment	158	224	210	-6%
	AY_Productivity	460	553	632	14%
MATHF002A	Enrollment	153	153	187	22%
	AY_Productivity	460	579	515	-11%
MATHF002B	Enrollment	107	144	173	20%
	AY_Productivity	640	647	656	1%
MATHF010.	Enrollment	1,566	1,756	1,772	1%
	AY_Productivity	582	669	653	-2%
MATHF011.	Enrollment	162	138	131	-5%
	AY_Productivity	422	620	588	-5%
MATHF012.	Enrollment	23		64	
	AY_Productivity	413		542	

MATHF022.	Enrollment	26	36	63	75%
	AY_Productivity	933	1,282	566	-56%
MATHF034H	Enrollment	50			
	AY_Productivity	248			
MATHF036.	Enrollment		2	4	100%
	AY_Productivity		#INF	166	#NAN
MATHF036X	Enrollment	1			
	AY_Productivity	#INF			

		2008-09	2009-10	2010-11	Chg 09-10 to 10-11
MATHF044.	Enrollment		29	30	3%
	AY_Productivity		521	539	3%
MATHF049.	Enrollment	671	774	748	-3%
	AY_Productivity	628	646	674	4%
MATHF051.	Enrollment	505	552	628	14%
	AY_Productivity	639	610	590	-3%
MATHF100.	Enrollment	6	31	1	-97%
	AY_Productivity	23	136		-100%
MATHF100X	Enrollment	16	19	11	-42%
	AY_Productivity	47	84	75	-11%
MATHF100Y	Enrollment	13	36	17	-53%
	AY_Productivity	143	707	92	-87%
MATHF101.	Enrollment	78			
	AY_Productivity				
MATHF105.	Enrollment	1,201	1,227	1,321	8%
	AY_Productivity	584	587	653	11%
MATHF108.	Enrollment			23	
	AY_Productivity			381	

MATHF220.	Enrollment	522	574	602	5%
	AY_Productivity	546	547	601	10%
MATHF221.	Enrollment	278	547	595	9%
	AY_Productivity	243	458	572	25%
MATHF224.	Enrollment		52	22	-58%
	AY_Productivity				
MATHF230.	Enrollment	170	225	225	0%
	AY_Productivity	956	1,264	1,264	-0%
MATHF230J	Enrollment	46			
	AY_Productivity	272			

		2008-09	2009-10	2010-11	Chg 09-10 to 10-11
MATHF230X	Enrollment	15	24	18	-25%
	AY_Productivity				
MATHF231.	Enrollment	439	424	415	-2%
	AY_Productivity	2,931	3,145	2,074	-34%
MATHF234.	Enrollment	7	21	45	114%
	AY_Productivity				
MATHF235.	Enrollment	371	249	191	-23%
	AY_Productivity	#INF	#INF	#INF	#NAN
MATHF236.	Enrollment	20	33	9	-73%
	AY_Productivity				
MATHF238.	Enrollment	49	33		-100%
	AY_Productivity	276	185		-100%
MATHF300.	Enrollment		95		-100%
	AY_Productivity		505		-100%

COURSE SUCCESS

		Pass		Did Not Pass		Withdrew		Total	
		Enr	Percent	Enr	Percent	Enr	Percent	Enr	Percent
MATHF001A	2008-09	463	63%	186	25%	91	12%	740	100%
	2009-10	508	59%	196	23%	157	18%	861	100%
	2010-11	531	57%	241	26%	153	17%	925	100%
MATHF001B	2008-09	361	66%	134	24%	54	10%	549	100%
	2009-10	391	61%	171	27%	80	12%	642	100%
	2010-11	357	52%	207	30%	121	18%	685	100%
MATHF001C	2008-09	231	70%	58	18%	42	13%	331	100%
	2009-10	233	63%	77	21%	57	16%	367	100%
	2010-11	261	62%	93	22%	64	15%	418	100%
MATHF001D	2008-09	116	73%	29	18%	13	8%	158	100%
	2009-10	156	70%	52	23%	16	7%	224	100%
	2010-11	133	63%	52	25%	25	12%	210	100%
MATHF002A	2008-09	128	84%	12	8%	13	8%	153	100%
	2009-10	106	69%	23	15%	24	16%	153	100%
	2010-11	155	83%	16	9%	16	9%	187	100%
MATHF002B	2008-09	83	78%	17	16%	7	7%	107	100%
	2009-10	98	68%	29	20%	17	12%	144	100%
	2010-11	130	75%	31	18%	12	7%	173	100%
MATHF010.	2008-09	987	63%	372	24%	207	13%	1566	100%
	2009-10	1139	65%	379	22%	238	14%	1756	100%
	2010-11	1135	64%	377	21%	260	15%	1772	100%
MATHF011.	2008-09	97	60%	47	29%	18	11%	162	100%
	2009-10	83	60%	36	26%	19	14%	138	100%
	2010-11	87	66%	24	18%	20	15%	131	100%

MATHF012.	2008-09	12	52%	7	30%	4	17%	23	100%
	2010-11	49	77%	5	8%	10	16%	64	100%
MATHF022.	2008-09	16	62%	8	31%	2	8%	26	100%
	2009-10	24	67%	7	19%	5	14%	36	100%
	2010-11	39	62%	11	17%	13	21%	63	100%
MATHF034H	2008-09	50	100%					50	100%
MATHF036.	2009-10	2	100%					2	100%
	2010-11	4	100%					4	100%
MATHF036X	2008-09	1	100%					1	100%

		Pass		Did Not Pass		Withdrew		Total	
		Enr	Percent	Enr	Percent	Enr	Percent	Enr	Percent
MATHF044.	2009-10	25	86%	3	10%	1	3%	29	100%
	2010-11	25	83%	1	3%	4	13%	30	100%
MATHF049.	2008-09	423	63%	179	27%	69	10%	671	100%
	2009-10	509	66%	172	22%	93	12%	774	100%
	2010-11	438	59%	191	26%	119	16%	748	100%
MATHF051.	2008-09	310	61%	133	26%	62	12%	505	100%
	2009-10	242	44%	189	34%	121	22%	552	100%
	2010-11	258	41%	191	30%	179	29%	628	100%
MATHF100.	2008-09	3	50%	3	50%			6	100%
	2009-10	13	42%	3	10%	15	48%	31	100%
	2010-11			1	100%			1	100%
MATHF100X	2008-09	8	50%	8	50%			16	100%
	2009-10	10	53%	7	37%	2	11%	19	100%
	2010-11	7	64%	3	27%	1	9%	11	100%
MATHF100Y	2008-09	10	77%	2	15%	1	8%	13	100%
	2009-10	20	56%	12	33%	4	11%	36	100%
	2010-11	6	35%	10	59%	1	6%	17	100%
MATHF101.	2008-09	65	83%	8	10%	5	6%	78	100%
MATHF105.	2008-09	640	53%	379	32%	182	15%	1201	100%
	2009-10	718	59%	325	26%	184	15%	1227	100%
	2010-11	652	49%	451	34%	218	17%	1321	100%
MATHF108.	2010-11	8	35%	12	52%	3	13%	23	100%
MATHF220.	2008-09	339	65%	119	23%	64	12%	522	100%
	2009-10	346	60%	169	29%	59	10%	574	100%
	2010-11	342	57%	178	30%	82	14%	602	100%

MATHF221.	2008-09	164	59%	52	19%	62	22%	278	100%
	2009-10	328	60%	160	29%	59	11%	547	100%
	2010-11	341	57%	176	30%	78	13%	595	100%
MATHF224.	2009-10	50	96%	1	2%	1	2%	52	100%
	2010-11	12	55%	9	41%	1	5%	22	100%
MATHF230.	2008-09	46	27%	77	45%	47	28%	170	100%
	2009-10	104	46%	78	35%	43	19%	225	100%
	2010-11	109	48%	73	32%	43	19%	225	100%
MATHF230J	2008-09	32	70%	12	26%	2	4%	46	100%
MATHF230X	2008-09	13	87%	2	13%			15	100%
	2009-10	20	83%	4	17%			24	100%
	2010-11	11	61%	6	33%	1	6%	18	100%

		Pass		Did Not Pass		Withdrew		Total	
		Enr	Percent	Enr	Percent	Enr	Percent	Enr	Percent
MATHF231.	2008-09	373	85%	19	4%	47	11%	439	100%
	2009-10	368	87%	13	3%	43	10%	424	100%
	2010-11	335	81%	37	9%	43	10%	415	100%
MATHF234.	2008-09	2	29%	2	29%	3	43%	7	100%
	2009-10	10	48%	11	52%			21	100%
	2010-11	28	62%	17	38%			45	100%
MATHF235.	2008-09	349	94%	22	6%			371	100%
	2009-10	249	100%					249	100%
	2010-11	191	100%					191	100%
MATHF236.	2008-09	20	100%					20	100%
	2009-10	29	88%	4	12%			33	100%
	2010-11	9	100%					9	100%
MATHF238.	2008-09	24	49%	13	27%	12	24%	49	100%
	2009-10	19	58%	10	30%	4	12%	33	100%
MATHF300.	2009-10	67	71%	19	20%	9	9%	95	100%

(END APPENDIX A)

APPENDIX B

Goal /Purpose – Met or In Progress	Resource(s) Awarded	Related Learning Outcomes	Related Strategic Initiative or Core Mission
Increase student success in sequence courses and improve teaching consistency. ○ Mentor and monitor PT faculty, in particular the evening sections. Create consistency in level of teaching. ○ Develop a math test to determine the preparedness. ○ Create booster classes (workshops) and gateway testing in PSME Center to raise student's foundational skills ○ Train PT faculty to instruct in a diversified manner to reach struggling and ESL students ○ Continually (at least once per year) update the SLOs and modify the courses accordingly Create two new sequences beyond Math 105. Expand a "pass the torch" Develop a math test to adequately gauge a	**PSME Center provided permit B---Budget funding for Graduate Students in the PSME Center. MathMyWay provided permit B---Budget funding for Tas in the classroom. Faculty Release time to mentor PT faculty as well as work on new pedagogy**	**1: Clearly communicate mathematical ideas through graphs, tables of data, equations, and verbal descriptions.** **2: Construct appropriate mathematical models of natural phenomena, develop those models with appropriate mathematical techniques, and interpret results of those models.** **1 & 2 above**	**Basic Skills** **Transfer** **Work Force** **Basic Skills** **Transfer** **Basic Skills** **Work Force**
	Received external funding to continue program.	**1 & 2 above**	**Transfer** **Work Force**

student's math skills entering precollegiate through Math 1B Stress to the students the time commitment needed in math for success and Counsel each student that appears to be at risk mathematically or cannot commit the necessary time. PSME's Aurora K--12 Aurora programs promote interest in the fields of science education by developing and disseminating programs designed to teach students about			

educational requirements. □ Increase the number of sections and course offerings: ○ Offer more sections based on student's demand; rooms available.	**Enrollment increased 7% over prior year**	**1 & 2 above**	**Basic Skills Transfer Work Force**
Goal/Purpose – Current or Continuing	**Resource(s) Requested** (Costs need to be included)	**Related Learning Outcomes**	**Related Strategic Initiative or Core Mission**
All Prior goals are continuing	**All Prior goals are continuing**		
1. **Faculty to develop web page templates that all faculty can use (especially thinking of the part--time instructors).** Google sites will be the next big thing in instruction. Templates would allow	**Release time of .111 for qtr or $4,500 in B--Budget**	**1 and 2 from above**	**Basic Skills Transfer Work Force**

faculty with limited web experience to get up and running with a website quickly. And it's all free! By creating web page templates, the department would have a uniform web presence. 2. **Increase student success in sequence courses and improve teaching consistency.** a. Mentorandmonitor PT faculty, in particular the evening sections. Create consistency in level of teaching. b. Developamathtest to determine the	**PSME Center B--Budget funding of $35K for Graduate Students in the PSME Center. MathMyWay requires B--Budget funding of $65K for TAs in the classroom.**	**1 and 2 from above 1 and 2 from above**	**Basic Skills Transfer Work Force Basic Skills**

preparedness. c. Create booster classes (workshops) and gateway testing in PSME Center to raise student's foundational skills			

d. TrainPTfacultyto instruct in a diversified manner to reach struggling and ESL students e. Continually(atleast once per year) update the SLOs and modify the courses accordingly f. Develop a math test to adequately gauge a student's math skills entering precollegiate through Math 1B g. Stress to the students the time commitment needed in math for success and h. Counseleach student that appears to be at risk mathematically or cannot commit the necessary time.	**Faculty Release time (.444) to mentor PT faculty as well as work on new pedagogy** **Goal is grant funding from NSF STEMway proposal.** **Goal is grant funding from NSF STEMway proposal.** **Goal is grant funding from NSF STEMway proposal.**	**1 and 2 from above** **1 and 2 from above** **1 and 2 from above**	**Transfer** **Basic Skills** **Work Force** **Transfer** **Basic Skills** **Work Force** **Transfer** **Basic Skills** **Work Force**

1. PSME's Aurora K--12 Aurora programs promote interest in the fields of science education by developing and disseminating programs designed to teach students about educational requirements.	**Require external funding to continue program. Hopefully from the Foundation.**	**1 and 2 from above**	**Work Force**

Unit Course Assessment Report - Four Column

Foothill College

Department - Mathematics (MATH)

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active	**Assessment Method:** Students are given a mid-term in week 5 featuring key concepts, including sample and population. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% of students will pass the test.	09/15/2011 - 82% of students passed in Spring 2011. (This is an example assessment for training purposes. May be deleted.) **Result:** Target Met **Year This Assessment Occurred:** 2010-2011 **Resource Request:** More calculators may improve pass rate.	
Department - Mathematics (MATH) - MATH 10 - ELEMENTARY STATISTICS - Probability - The student will be able to determine the likelihood of events. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 10 - ELEMENTARY STATISTICS - Inferences/Predictions - The student will be able to make accurate inferences or predictions about groups of interest using limited information. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 100 - OPEN COMPUTER LABORATORY -			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Numerical Problems - The students will be able to use analysis to set up and solve numerical problems. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 100X - OPEN COMPUTER LABORATORY - Numerical Problems - The students will be able to use analysis to set up and solve numerical problems. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 100X - OPEN COMPUTER LABORATORY - Skill Development - Student will spend the appropriate amount of time in PSME Center working on skills. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 100Y - OPEN COMPUTER LABORATORY - Numerical Problems - The students will be able to use analysis to set up and solve numerical problems. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:**			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Active			
Department - Mathematics (MATH) - MATH 100Y - OPEN COMPUTER LABORATORY - Skill Development - Student will spend the appropriate amount of time in PSME Center working on skills. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active	**Assessment Method:** Ask question on final exam. Example: Find vertex and x-intercepts for y=x^2+8x-16 **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% of students will give correct answer to question.		
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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 105 - INTERMEDIATE ALGEBRA -			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Simplifying Expressions - Simplify the following expressions: rational, radical, polynomial, exponential, and logarithmic (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 105 - INTERMEDIATE ALGEBRA - Applications and Modeling - Apply appropriate function in a contextualized situation (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 108 - ACCELERATED ALGEBRA - Graphs 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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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 SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Assessment Cycles: 2011-2012 **Course-Level SLO Status:** Active			
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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 108 - ACCELERATED ALGEBRA - Applications and Modeling - Apply appropriate function in a contextualized situation (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active	**Assessment Method:** Ask a student to compute interest **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% of the students will answer correct		
Department - Mathematics (MATH) - MATH 11 - FINITE MATHEMATICS - Probability - Student will be able to find the probability of			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
various events. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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 and multivariable differential calculus to the solution of application problems from the business, economics, and the social sciences. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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.			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
(Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 1A - CALCULUS - Differentiation - Use derivatives to graph, and to model and solve application problems using accurate mathematical notation. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active	**Assessment Method:** frogger **Assessment Method Type:** Class/Lab Project	09/15/2011 - Play frogger **Result:** Target Not Met **Year This Assessment Occurred:** 2011-2012 **Resource Request:** Need more video grames	
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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 1B - CALCULUS - Fundamental Theorem of Calculus - A student will be able to approximate definite integrals and apply the first and second fundamental theorems of calculus to help evaluate them exactly. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:**	**Assessment Method:** Pre-test		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Active			
Department - Mathematics (MATH) - MATH 1B - CALCULUS - Applications - A student will be able to model and solve application problems involving the definite integral or first order separable differential equations, and interpret their solutions in context. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 1B - CALCULUS - Mathematical Language and Notation - A student will be able to discuss integration problems and write solutions to them in appropriate mathematical language and notation. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 1C - CALCULUS - Multivariable functions			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
and relations - Students will be able to apply the theories and techniques of functions and relations of many variables to solve problems. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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 application problems. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
these concepts (e.g., the Divergence Theorem and Stoke's theorem). (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 217 - INTEGRATED STATISTICS I - Data Analysis - 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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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 SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Assessment Cycles: 2011-2012 **Course-Level SLO Status:** Active			
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. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 220 - ELEMENTARY ALGEBRA - Linear and Quadratic equations - Solve algebraically, graphically, and numerically linear equations, linear inequalities, linear systems of equations, and quadratic equations. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Course-Level SLO Status: Active			
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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 220 - ELEMENTARY ALGEBRA - Polynomials and Exponents - Simplify polynomial expressions and exponential expressions with integer exponents. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 221 - ACTIVITIES FOR MASTERY OF BEGINNING ALGEBRA CONCEPTS - Linear and Quadratic equations - Solve algebraically, graphically, and numerically linear equations, linear inequalities, linear systems of equations, and quadratic equations. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Department - Mathematics (MATH) - MATH 221 - ACTIVITIES FOR MASTERY OF BEGINNING ALGEBRA CONCEPTS - Applications - Model and solve application problems using linear equations, linear inequalities, and linear systems of equations. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 221 - ACTIVITIES FOR MASTERY OF BEGINNING ALGEBRA CONCEPTS - Polynomials and Exponents - Simplify polynomial expressions and exponential expressions with integer exponents. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 224 - ELEMENTARY ALGEBRA: SUMMER EDITION - Line Equation and Graph - Determine the equation and graph a line given information about the line. ? Given some context, create a linear model ? Provide the linear equation given a graph ? Interpret a point on a line in context ? Interpret the slope of a linear equation (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Department - Mathematics (MATH) - MATH 224 - ELEMENTARY ALGEBRA: SUMMER EDITION - 2 x 2 system of Linear Equations - Solve a 2 x 2 system of linear equations. ? Interpret the solution of a given system in context ? Solve a system of linear equations algebraically ? Solve a system of linear equations graphically ? Set up a system to model a story problem (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 230 - PREPARING FOR ALGEBRA - Operation Arithmetic - Able to do four operation arithmetic on real numbers without the aid of a calculator including order of operations. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 230 - PREPARING FOR ALGEBRA - Story Problems - Able to use the five step process to solve story problems. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 230 - PREPARING FOR ALGEBRA - Linear			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Equations - Able to solve linear equations. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 230J - PREPARING FOR ALGEBRA - Operation Arithmetic - This is the Capstone class and covers the full range of topics. Able to do four operation arithmetic on real numbers without the aid of a calculator including order of operations (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 230J - PREPARING FOR ALGEBRA - Story Problems - Able to use the five step process to solve story problems (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 230J - PREPARING FOR ALGEBRA - Linear Equations - Able to solve linear equations (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:**			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Active			
Department - Mathematics (MATH) - MATH 230X - ARITHMETIC PREPARATION - Whole Numbers - Identify, round whole number and write whole numbers using expanded notation (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 230X - ARITHMETIC PREPARATION - Number-Line - Represent whole numbers on the number-line (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 230X - ARITHMETIC PREPARATION - Order of Operations - Perform the order of operations to evaluate expressions with whole numbers (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 231 - MATH-SPECIFIC STUDY SKILLS - Good Student Characteristics - Identify the characteristics of a good student which they now possess. (Created By Department - Mathematics (MATH))			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Assessment Cycles: 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 231 - MATH-SPECIFIC STUDY SKILLS - Course Requirements - Articulate the requirements of the Math 230 course. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 234 - PREPARING FOR ALGEBRA: SUMMER EDITION - Operation Arithmetic - Able to do four operation arithmetic on real numbers without the aid of a calculator including order of operations. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 234 - PREPARING FOR ALGEBRA: SUMMER EDITION - Story Problems - Able to use the five step process to solve story problems. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 234 - PREPARING FOR ALGEBRA:			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
SUMMER EDITION - Linear Equations - Able to solve linear equations. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 235 - ALTERNATE CREDIT ARITHMETIC & MATHEMATICAL DEVELOPMENT - Demonstrate Abilities - The student must demonstrate the ability to do at least two of the following items: a) whole numbers and operations without a calculator b) fractions and mixed numbers and operations without a calculator c) decimals and operations without a calculator d) real numbers and operations without a calculator e) expressions and equations with integer coefficients and values for variables without a calculator f) expressions and equations with real number coefficients and values for variables without a calculator g) ratios, rates and proportions with calculator h) geometric figures / area and perimeter i) percents with a calculator j) using a scientific calculator and final preparations for Algebra (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 235 - ALTERNATE CREDIT ARITHMETIC &			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
MATHEMATICAL DEVELOPMENT - Successful Skills - The student must demonstrate the ability to successful demonstrate all of the skills prior to the highest level achieved in SLO #1. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 236 - ALTERNATE CREDIT ARITHMETIC & MATHEMATICAL DEVELOPMENT: SUMMER EDITION - Demonstrate Abilities - The student must demonstrate the ability to do at least two of the following items: a) whole numbers and operations without a calculator b) fractions and mixed numbers and operations without a calculator c) decimals and operations without a calculator d) real numbers and operations without a calculator e) expressions and equations with integer coefficients and values for variables without a calculator f) expressions and equations with real number coefficients and values for variables without a calculator g) ratios, rates and proportions with calculator h) geometric figures / area and perimeter i) percents with a calculator j) using a scientific calculator and final preparations for Algebra (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:**			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Active Department - Mathematics (MATH) - MATH 236 - ALTERNATE CREDIT ARITHMETIC & MATHEMATICAL DEVELOPMENT: SUMMER EDITION - Successful Skills - The student must demonstrate the ability to successful demonstrate all of the skills prior to the highest level achieved in SLO #1. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 238 - PREPARING FOR ALGEBRA - Operation Arithmetic - Able to do four operation arithmetic on real numbers without the aid of a calculator including order of operations. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 238 - PREPARING FOR ALGEBRA - Story Problems - Able to use the five step process to solve story problems. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 238 - PREPARING FOR ALGEBRA - Linear			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Equations - Able to solve linear equations. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 2A - DIFFERENTIAL EQUATIONS - Analytic Techniques - Solve differential equations with appropriate analytic techniques. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 2A - DIFFERENTIAL EQUATIONS - Numeric Techniques - Approximate solutions to differential equations with appropriate numeric techniques. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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 Cycles:** 2011-2012 **Course-Level SLO Status:** Active			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active	**Assessment Method:** exam		
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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 44 - MATH FOR THE LIBERAL ARTS - Problem Investigation - Investigate problems analytically, numerically, graphically, and verbally. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 44 - MATH FOR THE LIBERAL ARTS - Mathematical model Output - Interpret the output of a mathematical model in qualitative context. (Created By Department - Mathematics (MATH))			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Assessment Cycles: 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 44 - MATH FOR THE LIBERAL ARTS - Mathematical Outcome Justification - Justify the reasonableness of a mathematical outcome in qualitative context. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active	**Assessment Method:** writing prompt to be completed in class - pm **Assessment Method Type:** Exam - Course Test/Quiz		
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)) **Assessment Cycles:** 2011-2012 2012-2013 **Course-Level SLO Status:** Active			
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)) **Assessment Cycles:** 2011-2012 **Start Date:** 10/13/2011			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Course-Level SLO Status: Active			
Department - Mathematics (MATH) - MATH 48B - PRECALCULUS II - Modeling - A successful student will be able to model real-life phenomenon using 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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 48B - PRECALCULUS II - Function Analysis - A successful student will be able to graph, analyze and transform exponential and logarithmic functions. (Created By Department - Mathematics (MATH)) **Course-Level SLO Status:** Active			
Department - Mathematics (MATH) - MATH 48B - PRECALCULUS II - 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			
Department - Mathematics (MATH) - MATH 48C - PRECALCULUS III - Function Analysis - A successful student will be able to graph, analyze and transform linear, polynomial, trigonometric, exponential, logarithmic and rational functions. (Created By Department -			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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. (Created By Department - Mathematics (MATH)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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:** 2011-2012			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Course-Level SLO Status: Active			
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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			
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)) **Assessment Cycles:** 2011-2012 **Course-Level SLO Status:** Active			