

Las Positas College  
ANNUAL PROGRAM REVIEW TEMPLATE  
Review of AY 2011-12

Name of Program	Division	Author(s)
Mathematics	STEMPS	Kristy Woods, Teri Henson

**INSTRUCTIONS:**

1. This Annual Program Review covers the time frame academic year 2011-2012.
2. The planning should be for the academic year 2014-2015.
3. Use the Save As feature in Word to save this template with your program name, so that you do not overwrite the original template (e.g., Bio, math, EOPS)
4. In each section, click in the box under the instructions and fill in your information. The box will expand as you type. If a section is not pertinent to your program enter N/A in the box; do not leave it blank.
5. To see how other programs completed sections in the Annual Program Review, visit the Examples Template on the PR website. The examples are from a variety of programs and may give you ideas of how to respond for your own program.
6. When you have completed the form, run the spell-checker (**click inside the text in the first box**, then click on the Review tab and find Spell-Check in the far left corner of the ribbon).
7. Please address your questions to your Program Review Committee representatives or the PR co-chairs Jill Carbone and Teri Henson. Concerns, feedback and suggestions are welcome at anytime to PRC representatives or co-chairs.
8. Instructions for submitting your Annual Program Review will be available at the start of the fall semester.

**STATEMENT OF PURPOSE:**

- Review and reflect on the student experience, with the goals of assessing and improving
  - student learning and achievement
  - services for students
  - program effectiveness.
- Provide a forum for each program's findings to be communicated to Administration
- Create written records of what is working well, what can be improved, and specific plans for implementing chosen improvements.
- Collect information that will contribute to institutional assessment and improvement.

**I. MISSION**

State the current program mission

*(A mission statement should address the unique role and scope of the program. Consider the operating mission of your program. Identify specific purposes within your program (e.g., certificates, degrees, general education, matriculation, assessment). Avoid vague, overbroad language.)*

<p>The mission of the mathematics department is</p> <ul style="list-style-type: none"><li>• to cultivate in our students<ul style="list-style-type: none"><li>○ the ability to think mathematically</li></ul></li></ul>
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- to demonstrate critical thinking
  - to provide assessment-based instruction in all math courses.
- We use multiple modes of delivery and support mechanisms to foster student success and to prepare our diverse student body for graduation, transfer and immediate job entry.

**The mission of Las Positas College is:**

*Las Positas College is an inclusive, student-centered institution providing learning opportunities and support for completion of transfer, degree, basic skills, career-technical, and retraining goals.*

**(NOTE:** this is the draft mission statement, currently under review.)

Discuss how the program supports the college mission.

The Mathematics Department's mission statement puts the focus on students and demonstrates our commitment to providing mathematical instruction that is inclusive through the use of multiple modes of delivery and pacing and support mechanisms. We offer the most needed courses in both regular lecture and distance education modes. In addition, we offer basic skills courses in half-paced versions through our Math X program, as well as in lecture mode. Our TBA lab hours provide opportunities to focus learning on core student learning outcomes and to explore math topics in more depth. In addition, our TBA lab hours are used to run the Open Math Lab in the Integrated Learning Center, which provides a venue for students to complete their lab hour requirement as well as to seek help with their math homework. Through the use of multiple modes of instruction and support, we provide opportunities and support for completion of students' educational goals. Our course offerings include a thorough grounding in basic skills through the Pre-algebra, Elementary Algebra, Intermediate Algebra sequence. At the transfer level, we offer the full range of math courses need for STEM majors, as well as Business Calculus, Finite Math, and Statistics. This fall we are submitting to the Curriculum Committee an outline for a new transfer level course called Math for the Liberal Arts which will provide an alternative for non-STEM students needing a math course transfer. Most of our transfer level courses satisfy the CSU GE Breadth and IGETC quantitative reasoning area. In addition, many of our math courses articulate as major preparation with a variety of UC's and CSU's. Students seeking an associate degree can select a mathematics area of emphasis and we offer an ADT in Mathematics. Our Business Calculus, Finite Math, and Statistics offerings support students in business and psychology majors. Recently we partnered with the ECD department to offer Pre-algebra, Elementary Algebra, and Intermediate Algebra courses with ECD-relevant context-based learning.

**II. PROGRAM ANALYSIS****A. Courses (For Instructional Programs Only)**

1. Will any course outlines be revised or updated in the academic year 2014-2015?

**(Highlight the appropriate box to type in an X.)**

YES  NO

**If yes**, in the table below, please list which courses will be revised or updated and the reason for the revision.

*(Click in the box under Courses to start entering information. Tab to move to the next box. Tab in the last box to create a new row.)*

Course(s)	Reason for Revision
Math 20	Title V upgrade, C-ID approval

2. Will new curriculum (*e.g.*, course outlines, degrees) be submitted to the Curriculum Committee for the academic year 2014-2015?

YES  NO

**If yes**, please describe briefly what new curriculum is planned.

Click here to enter text.

### B. New Initiatives (AY 2014-15)

Are any new initiatives planned for the academic year 2014-15?

*(Examples of new initiatives include, but are not limited to: new degrees or certificates, new pathways, new outreach efforts.)*

YES  NO

**If yes**, please describe briefly what new initiatives are planned.

Part of the Math Department's mission statement is to provide assessment-based instruction, in multiple modes of delivery and support mechanisms to foster student success in our diverse student body. Towards this goal, there are several new and ongoing initiatives that we will be focusing on in 2014-15.

- Algebra Review Course: Many high school and returning students are placing into lower math courses than they have demonstrated proficiency in at their high schools. In addition, many of our students at Las Positas College find themselves unable to succeed in their math course or have postponed fulfilling their math requirement and therefore have forgotten the math needed to succeed in the course they have placed into. Research into success data at Las Positas indicates students are TWICE as likely to successfully complete a transfer-level math course within three years if they START in a higher course. Many community colleges in California and across the United States are implementing effective, algebra review courses to address these issues. Kristy Woods has applied for sabbatical for Fall 2014 and Fall 2015 with the goal of researching successful algebra review support courses offered at the community college level with goal of implementing one at LPC in the future. Conversations have already started with Administration.
- Observation of Instruction in Math X: Before the current FA contract, we had a

specialized observation of instruction form for Math X. This was needed because the ways in which students interact with the material and instructor are very different (from face-to-face or on-line) in this mode of instruction. The approved FA observation forms no longer meet the needs of Math X observation. We need to work with the FA to develop a suitable Math X observation form and have it approved.

- Training for Math X: Courses taught in the Math X mode have changed dramatically in recent years and will continue to change as we make incremental changes towards revamping the program. Training of Math X instructors and instructional assistants should be improved and incentives created to promote best practices in our Math X sections.
- Improved Tutorial Support: Improve and expand the training of student math tutors through the Tutorial Center to better equip them to support our diverse student body in understanding the mathematics. Tutoring is now happening one-on-one, in small groups and embedded in the Math X mode. We need to determine how to make the best use of the tutor time in Math X.

In addition, as time and resources permit, we would like to address these areas:

Course Equivalency: an outgrowth of the work done on course equivalency brought to light a problem with equivalency between our A/B and X/Y courses. Although listed as equivalent in banner, and treated as equivalent for purposes of repeatability, these courses are not being considered equivalent for grade replacement. As a result, student transcripts are incorrect because the transcripts are not excluding from the GPA prior attempts at an equivalent course(s). [For example, student received an D in M65A in Fall 2011 and received a B in M65X in Spring 2013 still has the D calculated into their GPA.] We need to work with Student Services to:

- Find out how many students this potentially affects and contact students appropriately
- Correct the issue within Banner to allow for automatic correct calculation on transcripts

Support for Repeating Students: The Math Department would like to work with Student Services to institutionalize several practices that target students who are repeating a mathematics course. These practices seek to communicate to students best behaviors and emphasize using free supports on campus (such as open math lab, tutoring, office hours, various modes of instruction, etc.) to help them be successful in their current attempt. These practices are:

- automatically sending an email to students early in the semester who are repeating with information identifying them as a repeater student and emphasizing what best practices are and free supports to ensure that this semester they are successful
- have students repeating for the third time sign a student success contract before the Dean of Student Services sign a repeater card.

Tutoring: The Math Department would like to work with the Tutorial Center to improve student tutoring in mathematics.

- There is a need for increased student tutoring, in small groups, one on one, and embedded in the Math X program.
- There is a need to improve student tutor training
- There is a need to improve the quality and optimize the usage of embedded student tutors in the Math X Program

Adapting to Technological Change: The student body has changed dramatically over the last five years, as has technology and their desire to use it. We must adapt to these changes and determine how to respond. This is why Adapting to Technological Change is one of our Initiatives. The Math Department has focused on incorporating supplemental technology supports in the basic skills math courses and in many of our transfer level courses. As students and technology evolve, we must also continue to improve supports for our students based on pedagogy and cost-efficiency. Some additional things we would like to research:

- How to optimize existing technology in Math X to accelerate student movement through the material. We have the capability, but not the time to research and implement more streamline, personalized assessments that would allow students to focus only on concepts they are lacking and not move linearly through the material but rather take advantage of the self-paced, mastery learning flexibility that is unique to the Math X mode.
- Explore software for use in classrooms such as Winplot, Maxima CAS, GNUplot, Mathematic CAS, and statistical software as well. The rationale for this is that the TI calculators are very expensive and heading toward being obsolete. Students can download cheaper apps for their smart phones that are fully functional as graphing calculators but are not permitted for many classroom activities such as exams because of security issues. Exploring less expensive or free options will save students money.

### C. SLOs/SAOs

#### 1. Status of course SLOs/SAOs and assessments for AY 2011-12.

*(Since the Program Review process is beginning in 2013 and the assessments for AY 2012-13 will not be complete, analyze the assessments for the AY 2011-12). Click in the box under Number of Courses Offered. Press Tab to move to the next box. Press Tab at the end of the row to create a new row.*

Number of Courses Offered (AY 2011-12)	Number of Courses with SLOs (AY 2011-12)	Number of Courses Assessed within the last TWO years (AY 2010-11, AY 2011-12)
24	24	21

3. How frequently have course SLOs/SAOs been assessed? (e.g: every semester, every other semester, once a year.)

*(This is a summary; it is not a list of courses and their assessment frequency.) Click in the box and begin typing. The box will expand as you type.*

Course SLOs have been assessed in all classes offered every semester, not including the summer.

4. Status of program-level SLOs/SAOs and assessments for AY 2011-12.

Number of degrees/certificates offered	Number of degrees/certificates with SLOs	Number of program level SLOs/SAOs
1	1	5

5. Analysis of SLO/SAO data for AY 2011-12.

*(Attach a summary of the program's AY 2011-12 SLO/SAO data as an appendix.)*

1. Please describe the program-wide dialogue on assessment results, including assessment of distance education courses. Where would one find evidence of this dialogue?

*(This section concerns the type and variety of dialog regarding assessment results, not the assessment results themselves. For examples of evidence, consider: meeting notes, program coordinator's records of dialogue, or email.) For each of these questions, click in the following box and begin typing. The box will expand as you type.*

The Math Department discussed SLO Data at a departmental meeting held on September 13, 2013. Full-time, and some part-time, faculty met for two hours to discuss the results of the SLO assessments. Detailed minutes were recorded by Ashley McHale and will be posted on the Math Department Blackboard website to provide evidence of this dialogue.

2. Please summarize what was learned from the assessments, including distance education courses. How will these results be used for improvement/s?

*(Please provide at least two paragraphs. One paragraph should address face-to-face assessments, the other paragraph should address distance education assessments. If the course is taught in both face-to-face and distance education modes include a paragraph comparing the assessment results.)*

**Basic Skills:**

For Math 107, 107A, 107B, and 71A and 71B we had little to no data to discuss due to low enrollment, and/or course instruction by part-time faculty who are not required to assess SLOs and enter data.

For Math 65 we saw relatively good levels of proficiency across most of the SLO's, but we need to work on teaching contextual problems by improving instructional material, lab assignments, and general extra assignments.

The Math 55, 55A, and 55B results were pretty solid across all SLOs.

**Transfer Level:**

The Math 42 results were a little weaker than the Math 44 results, with understanding probability being an area to improve upon in both classes.

In Math 38 we found that students struggled with modeling (applications). We are planning to revamp Math 38 starting next semester.

For Math 20 we had only one section's worth of data entered for each semester, but the results were good overall.

For Math 33, 34, 7, 5, and 3, the results were very positive.

For Math 2 we felt that students' assessment results for the communication SLO (interpreting the interval of convergence) were not acceptable.

For Math 1 we need to improve students' comprehension of optimization modeling.

We need to do more outreach to our part-time faculty, to ensure they are incorporating the SLOs into their teaching and assessment practices and promote their involvement in the assessment data collection process.

#### DE SLO Assessment Results:

Data was quite limited for Math 42 DE and 42 DE, since we only have one section of each in a semester and low success rates. We do need to improve how we teach probability.

Math 55 and Math 65 are taught in two hybrid modes: one in which all instruction is carried out via distance education and one in which students have face-to-face instruction one day per week. However, there was little difference in the SLO data for the two versions.

Math 55 DE students' assessment scores were low in all SLO areas: of multiple representations of functions, problem solving (finding the domain and range of a function), and communication (solving and interpreting an applied problem).

In Math 65 DE we saw low scores in the modeling SLO (construct a linear model).

#### DE vs. Face-to-Face:

In comparing the DE to face-to-face classes, we see that the results for our stats courses are the same, but for our algebra courses, the Math 55 DE students had a much harder time understanding domain and range than the face-to-face students. Students in both modes had similar problems with modeling.

We have developed several excellent labs which support this SLO and the current textbook was chosen in part because it also provides strong support in modeling. Modeling is difficult to teach, compared to "skills" such as factoring, because it involves higher level cognitive skills, an ability to read for important information, and a deeper understanding of mathematical relationships. We have chosen a textbook which supports modeling and developed several lab assignments which support this SLO, as well. We may need to devote more class time to this instruction and provided more opportunities for students to practice this type of learning.

It is unclear why SLO results are so disparate when comparing 65/55 face-to-face with 65/55 DE. One reason may be that, while the number of students completing the SLO assessments is much smaller in the DE classes (as there are fewer sections and success rates are lower than in face-to-face). the students who make it to the end tend to be the strongest students in the class. Hence, we see, for example, in fall 2011, Math 65 face-to-face, 35.7% proficient in the interpretation of slope SLO, while in the DE classes, 58.5% were deemed proficient. Similarly, in fall 2011 we saw 11.8% of DE students proficient in the linear modeling SLO, while in the face-to-face classes only 7.1% showed proficiency. As

noted above, modeling is an area in which students struggle the most.

On the flip side, in fall 2011, students in 65 face-to-face had higher levels of proficiency in the graphing linear equations, compared to DE students (56.2% vs. 35.3%). This may be due to the greater likelihood that students in face-to-face classes engage in more paper-pencil graphing than students who are learning on-line, since all graphing is done with the computer software.

We see similar disparities in the SLO data for 55 face-to-face compared with DE. Multiple representations is a particularly egregious example, with 8.3% of DE students showing proficiency compared to 50.8% in face-to-face (fall 2011). Here again, it is possible that reliance on the computer for graphing may play a factor. On the other hand, in fall 2011 DE students showed much greater proficiency in the domain and range SLO compared with face-to-face students (70.8% vs. 38.5%).

Some general conclusions:

There are many sections of 65 and 55 taught by many different instructors each of whom brings their own ways of teaching to the class. DE sections tend to be taught by a handful of instructors who are the same from semester to semester, so there is more homogeneity in the way DE instruction occurs.

There are fewer students completing DE courses and they tend to be very strong students. There is likely greater variability in abilities of the students completing the face-to-face classes.

Instructors for the face-to-face and DE classes use similar labs and support materials for these SLOs. They will examine the assignments that support the SLO's and work on ways to improve those assignments.

3. To what extent will, and how, do assessment results support resource requests for AY 2014-15?

One area in which we have almost no SLO data is for our Math X classes. One reason is that the number of students finishing tends to be low, but also because we lack instructional assistant support and coordination of the program is difficult (since we lost our full-time instructional assistant). Because Math X instructors have students in 8 different courses, some of whom finish at different times, grading and entering SLO data is particularly burdensome. With additional IA support and a Math X coordinator, we could carry out assessment of SLOs and entering the data in an organized and efficient manner that does not create an undue burden on the instructor. Our results will support our request for additional Math X support (Instructional Assistant and coordinator).

4. What are the general plans for assessments in the upcoming academic year AY 2014-15 (*i.e.* additional assessments or reassessment)?

We will continue assessing all SLOs in each course, every semester. We are modifying the rubric to the new scale 1-5.



**D. Student Data**

- Analyze the student data provided by the Office of Institutional Research (<http://www.laspositascollege.edu/researchandplanning/ProgramReview.php>) and other data as appropriate (for example: SARS-TRAK data, library student surveys).

- Please describe the program's dialogue about the student data. Where would one find evidence of this dialogue?

*(This dialog should be occurring as you write your Program Review of 2011-2012. Examples of evidence may include: agenda or minutes from workshops or meetings, internal reports. Smaller programs may want to consider discussing their data with related programs, their Dean, the Institutional Researcher or, for academic programs, adjunct faculty in the program.) For each of these questions, click in the following box and begin typing. The box will expand as you type.*

The Math Department discussed Student Data at a departmental meeting held on September 13, 2013. Full-time, and some part-time, faculty met for two hours to discuss the data. Detailed minutes were recorded by Ashley McHale and will be posted on the Math Department Blackboard website to provide evidence of this dialogue.

Data for the discussion was provided by Rajinder Samra, LPC Institutional Researcher. For our analyses we looked at success rates for the whole campus, Math-specific data of headcounts, student unit loads, educational goals, and student success/completion rates by course.

- Please summarize what the program learned from the student data. How will these results be used for improvement/s and planning?

*(Briefly discuss trends or significant findings regarding student retention, success rates, different cohorts of students, etc. Student data may suggest the need for changes in course offerings, scheduling, teaching methodology, outreach, processes, etc., or may lead to the creation of a new SLO/SAO.)*

Most of our Math students, approximately 65%, are full time students. Success in school (should) be a major focus.

The percentage of students with an education plan increased from 70% in 2007 to 75% in 2011. Two (probable) reasons for this increase are 1) new state legislation requiring students to have an educational plan, and 2) the general economic downturn and resultant crisis in higher education which has brought more students to the community colleges.

Most Math students, 70 - 75%, have transfer to a four year college, with or without an associate's degree, as a goal. The next largest group, 12%, are undecided. Our conclusion is that our transfer level courses are vital to students' educational goals.

**Planning:**

- Since many of our students assess into math classes below transfer level, where success rates are low, improving student success and finding ways to help students complete their math requirements will continue to be a major areas of focus for us.
- During our discussion, a key question that arose is how many of our transfer students are science / technology / engineering / mathematics (STEM) majors and how many

are NON-STEM. We might further break non-STEM down into various areas such as business, social sciences, career technical, and arts. Data that addresses this break out would help us plan for the various math courses and course progressions. A related question is in what courses are these students starting their math progressions at LPC? Are the STEM majors starting in Calculus I? Are the business majors starting in Math 55? We will be requesting additional data from IR to help us answer these questions.

3. The department plans to research non-STEM pathway(s), common core standards, ICAS standards, and approaches with more context based learning. We also need to revisit exactly what the CSU/UC expect students to know when they accomplish a course.

### **Success in Math Classes, by class**

Course success means that the student received an A, B, C, Pass, or Credit in the course.

### **Basic Skills:**

**Prealgebra** - Math 107 - new curriculum was introduced in Fall 2008. There are no success trends. During the economic downturn the number of lecture sections offered was drastically cut, and many of the students starting in Math 107 have had no option but to take it in our Math X program (More than 50% of our Math X classes are made up of Math 107 students.). We are seeing improvement in Math 107X and 107Y, possibly due to the new curriculum and use of computer-supported learning, but instructional support in Math X is very limited, as are the number of Math X course offerings. The students needing the most support, those in 107X, have the greatest variability in their success rates and no clear trend toward improvement can be seen.

**Elementary and Intermediate Algebra** - Math 55 / 65 - completion rates improved in Fall 2009. This was when we introduced a significantly revised curriculum for these two courses. A single Math 55 / 65 text was adopted and the overlap between the two courses was cut back.

In Fall 2009, the Math requirement for a AA/AS degree was raised from Math 65 to Math 55. This "should" have had the impact of lowered rates. We do not see this.

In general, success rates are poor though over these years there is an upward trend. Completion rates of the 107/65/55 sequence improved. We also noted that success rates improved in our Math 65X and 65Y courses, possibly due to improved support through the use of computer aided instruction.

As with Math 107, Math 55 / 65 students need more support in Math X.

It is difficult to assess Math 65A/B, our half paced courses, because we have only one/two sections, one/two instructors each semester.

The Integrated Learning Center (ILC) and TBA lab hours requiring 1 hour/week attendance in the ILC were in place throughout the years covered by this data.

**Planning:** Regarding Math X performance, we would like to have additional data indicating how many students did X & Y in the same semester.

**Several points were made regarding the issue of math placement.**

An Algebra Review course (short - approximately 1 month) may help students to place in a more appropriate class. Anecdotally, we know many students are resentful repeating classes that they've taken in high school, which is not good for success.

It was also noted that 10 years ago a student would take an assessment test and then meet with a counselor, who looked at the student's transcripts as well as their placement exam results. A counselor could place a student in a higher level class if their placement results were borderline. This was called multiple measures. Given the loss in resources, LPC counseling cannot do that now and we must rely solely on assessment testing for placement.

**Planning:** We will be accepting EAP as another measure of placement and will be asking for data to be collected over the next three years for future analysis.

**Transfer Level:**

**Statistics - Math 44, 41, 42A and 42B** - success rates, in classes with >10 students, range from ~ 50-60%. There was no pattern over these years. This list of courses includes a breadth of Statistics offerings. During these years there was a textbook change from Bluman (used through ~ 2009) to Triola (used ~ Fall 2010 - Spr 2012) back to Bluman.

**Planning:**

1. Beginning in Fall 2014, we will offer a single 4 unit statistics class, Math 40.
2. Statistics is very much an applied, contextual math class. Our Math 55, the prerequisite for Statistics, tends to focus on symbolic manipulation and preparation for the STEM math sequence. Perhaps, an intermediate algebra more geared to contextual applications should be offered. Math for Liberal Arts, another contextual, transfer level class is not yet offered but is being planned. The application focused prerequisite would serve that course, as well.

**STEM Math Courses** (38, 20, 1, 2, 3, 5, 7) – in general success rates were held to be acceptable and were fairly steady over the time period 2007-2011, with the exception of Math 38 Trigonometry with Geometry, which has unacceptably low success rates (around 50%). There may be several reasons for this; content-wise, it is a big step up from Intermediate Algebra, plus while many students in Intermediate Algebra have had the course (as Algebra II in high-school), Trigonometry is new material. The content is conceptually challenging, as well more mathematically rigorous.

**Planning:** we will be reviewing the Pre-Calculus curriculum next year, with a focus on Trigonometry and will consider ways to improve success in this course.

**Distance Education**

Note that Math has two modes that are both called distance education. 1) Courses that meet face-to-face (approximately) five times / semester for exams. 2) Hybrid courses that meet face to face once/week. Math 55 / 65 are offered in both of these modes. Math

42A/44/42B/41 are offered only in mode #2.

There has been much research and interest in distance education - globally, nationally, and locally. The lack of completion and success at LPC is consistent with what is seen elsewhere. It is poor.

**Planning:**

1. Data broken out by these two different modes would be helpful.
2. Distance education pedagogy is being improved and the culture is changing. What will come of DE is to be seen. The Math department believes that we should continue to offer these classes, to work on improving student interaction and support, and to monitor the success data.

3. To what extent, and how, do the student data results support resource requests?

*(If relevant, briefly explain how your student data may be improved by acquiring new or additional resources (eg: faculty, classified personnel, instructional equipment, facilities) that you plan to request. You will be asked to provide more detailed information on the resource request forms; this is just a brief summary.)*

**Resource Requests**

A full time, dedicated Math X Instructional Assistant (IA), is needed to support the program on a daily basis. This person would handle all daily administrative duties of the Math X Program. Each Math X class has at least 42+ students. With the support of a full time IA, the Math X instructor to work one on one with students needing help with their Math X course. Without the IA, students are underserved and experience long waits in getting help. The IA would also assist the requested Math X coordinator with scheduling and other administrative duties.

A Math X Faculty Coordinator, with 1 unit of release time, is needed to coordinate the courses offered in this mode. Math 107, Math 65, Math 55 and Math 71 are all currently offered in this mode. As materials, assessments, training and supports change in there, a faculty member is needed to coordinate the efforts and details.

More institutional research is needed in order to inform future initiatives. The more specific, deeper levels would allow us to better analyze student success.

6. Enrollment Management (**Instructional programs only**)

- a. What total FTEF was approved for the program in 2012-13? This data is found in your Discipline Plans.

The Mathematics department was approved for 46.1 FTEF for Fall 2012-Spring 2013

- b. If this amount differs from 2011-12, describe what changes have occurred.

(To find Total FTEF for AY 2011-2012 consult the Enrollment Management data on the IR website. (<http://www.laspositascollege.edu/researchandplanning/ProgramReview.php>). If your allocation was less than the previous year, comment on the types of courses that were cut. If the allocation was more, indicate which classes were added and why.)

In the 2011-2012 academic year, the math department was approved for 46.32FTEF which means we saw a 0.22 FTEF decrease from 2011-12 to 2012-13. One class (a section of Math 65A) was cut from the fall 2012 semester. These cuts were mandated as part of the overall reduction in course offerings that occurred during the years when budgets were cut.

- c. Describe and explain any changes you anticipate in course offerings for the academic year 2014-15.

If the college gets funded for growth next year, the Mathematics department would like to add a section of Math 107, which was cut, and increase the number of our Algebra and Statistics offerings since they are highly impacted and students need them to get degrees and to transfer. Our Calculus for Business (Math 34) and Trigonometry with Geometry (Math 38) are also heavily impacted and we would like to offer an additional section of each course. Currently we offer only one section of Math 34 each semester. In spring 2013, when students were registering for fall classes, the wait list for Math 34 closed on May 2, and had 20 students on the wait list. For fall 2014 we offered three sections of Math 38. For those three sections, the wait list closed on May 6, 9, and 10, respectively. There were 17 students on the wait lists for two of the sections and 11 on the third section. Starting fall of 2014 we will be offering Math for the Liberal Arts. Without additional FTEF to offer this class, we will have to reduce the number of sections of Statistics to provide FTEF for the Math for the Liberal Arts course.

### E. Human Resources (in AY 2011-12)

1. Please complete the following table.

(Enrollment Management data is posted on the IR website:

<http://www.laspositascollege.edu/researchandplanning/ProgramReview.php>).

Total FTEF*	FTEF from Full-Time Faculty*	% FTEF from Full-Time Faculty **
51.37	21.79	42%

\* If your program consists of multiple rubrics (eg: Anatomy, Ecology, Microbiology) sum values from all rubrics

\*\* If your program consists of multiple rubrics, use the following equation to calculate the % FTEF from Full-Time Faculty: Divide the FTEF from Full-Time Faculty by the Total FTEF and multiply by 100.

Type of Personnel	Number	Shared? With whom? If shared, state % of time assigned to the program	No. of hrs/wk	No. of mo/yr
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full-time classified staff*	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
regular hourly classified staff**	1	Click here to enter text.	10	9
One student assistant Math X One Student Assistant in the ILC (Open Math Lab)	2	Click here to enter text.	Approx. 8 hrs/wk in Math X; Approx. 10 hrs/wk in the ILC here to enter text.	8

\* full-time: 20 hrs/wk (50%) to 40 hrs/wk (100%)

\*\* regular hourly: 18 or fewer hrs/wk (45% or less)

7. Will human resources be adequate for the academic year 2014-15?

YES  NO

**If No**, briefly describe. Provide any data which support these needs.

The Math X Program is a unique mode of instruction that supports the College Mission of creating “inclusive, student-centered... learning opportunities and support for completion of transfer, degree, basic skills, career-technical and retraining goals” and the Math Department’s Mission of fostering student success by offering various modes of instruction.

We need to restore the level of instructional assistant support to the Math X Program. The instructional assistant level III is a cost effective way to provide management of the program on a daily basis and the student and faculty support needed. In 2009 we had a full-time IA, two part-time IA's, and we offered twelve sections of Math X. Over the last few years the combination of losing our full-time IA, and the budget crisis forced us to cut a number of sections of Math X - mainly due to the lack of IA support. Currently we offer only five sections of Math X and have only one part-time IA to help provide support for 43+ students per section and a faculty member. Having a full-time IA would

- enable us to provide much needed support for the Math X program;
- allow us to begin to regrow the Math X program, both in terms of serving other populations and offering more sections; and,

- potentially, allow the math department to offer test proctoring for math instructors (another support system to faculty and students that we were forced to cut).

A Math X Faculty Coordinator, with 1 unit of release time, is needed to coordinate the courses offered in this mode. Math 107, Math 65, Math 55 and Math 71 are all currently offered in this mode. As materials, assessments, training and supports change, a faculty member is needed to coordinate the efforts and details.

8. Are there Staff Development needs for the academic year 2014-15?

YES  NO

**If yes,** elaborate. Provide any data which support these needs.

In addition to continued support for faculty members to attend conferences, we would like to increase the inclusion of our part-time faculty in departmental meetings. With around 30 part-time instructors, who teach a large percentage of our basic skills and statistics courses, inclusion of these instructors in discussions of SLO's and other data, best practices, and departmental policies (e.g., TBA lab hour policy) is critical to ensure consistency and high quality across all sections. Increasing their awareness of the importance of SLOs and student success issues, and increasing their participation in finding and implementing solutions for instructional problems, is an essential component in any planning for improvement. For instance, we would like to continue to hold workshops to encourage best practices and inform faculty of the latest trends involving the use of instructional technology in the classroom. Offering a stipend to part-time faculty (and variable flex credit for full-time faculty) might encourage participation.

## F. Technological Resources

Are there any **new** technological needs for the academic year 2014-15?

*(Do not discuss your existing technology, including replacements and repairs of existing technology. DO discuss new needs.)*

YES  NO

**If yes,** briefly describe. Provide any data which support these needs.

*(Examples of relevant data might include: enrollment information related to the growth of your program, workforce demands/trends, obsolete or outdated equipment and/or software.)*

In most of the Basic Skills math courses and lower-level transfer courses, instructors require students to use supplemental, online resources to explore concepts and complete assignments. In Fall semester 2013 students met unacceptable levels of disruption in service. It is not clear whether the disruptions were a local issue, as significantly more sections are requiring bandwidth in order to access materials, or if it was a disruption on the publishers' side. We need

- Faster computers in the Math X and ILC, in regards to start up and performance.
- Faster internet connection

It is vitally important for student retention and success that student frustration is kept at a

minimum and they have regular, consistent access to their assignments.

### G. Facilities, Equipment, and Supplies Resources

Are there any new facility, equipment or supply needs for the academic year 2014-15?  
*(In this section consider new facilities, equipment and/or supplies that are needed to support your program. This does not include your current items that need replacement. Definitions of these terms may be found in the glossary.)*

YES  NO

**If yes**, briefly describe. Provide any data which support these needs.

*(Examples of relevant data might include: data on program's growth, change in curriculum, ADA regulations, etc.)*

Facilities: The Mathematics Department would like to reiterate our ongoing need for a Mathematics Center, as discussed in detail in the 2011-2012 Program Review Update, as well as in our 2010 Program Review. The ideal Mathematics Center would house:

- Dedicated smart Mathematics Classrooms with technology to support the discipline
- Math X Lab
- Open Math Lab
- Mathematics Tutoring Center
- Proctoring Center
- Math Faculty Offices

Supplies:

- Additional calculators for Math X  
 Rationale: Student demand is high and we need to accommodate more students if possible.
- Subscription for mathematics magazines for library  
 Rationale: Having mathematics magazines could enhance the character and depth of mathematics and science students and encourage exploration of additional topics beyond the scope of the course outlines of record.

### H. Financial Resources

1. Is there a Program budget for the academic year 2014-15? (Include any co-curricular funds)

YES  NO

**If yes**, please briefly describe amount and general uses.

In the school year 2011-2012 our budget was dramatically reduced to \$500 per school year from \$1000 in previous years. This budget has been used primarily to purchase supplies for the Math X program (paper, printer cartridges, pens, etc.) and to provide whiteboard markers and supplies for the faculty in lecture classes. Occasionally, it has been used to purchase software or software upgrades. The \$1000 budget had been sufficient for our



needs.

In addition to these fiscal resources, the Mathematics Department has a co-curricular account. The annual budget is \$480. Revenues are generated by the Mathematics Department graphing calculator rental program during fall, spring, and summer semesters. Expenses include paying for the AMATYC Student Mathematics League registration fee, purchasing recreational mathematics books and related materials that are used for prizes to (1) the five students who make up the college's AMATYC team and (2) the Math Club/Mu Alpha Theta Mathematics Honor Society Sudoku Award recipients, (3) and sponsoring Math Department scholarships for Math Club/Mu Alpha Theta students. Additionally, the Math Club Advisors have been discussing the idea of covering partial funding so that a couple of Math Club students could attend a local/regional Mathematics Conference.

Although this not part of our budget, the Division budget has included money to pay for student assistants. Through a combination of federal work study dollars and the STEMPS Division funds, we have been able to hire student assistants for both the Math X program and the ILC. We need to ensure we will have continued and sufficient funding so that we are able to fill these much-needed positions. Obviously we need to have student with proper mathematical background and tutoring skills. It is important note that in cases where students do not qualify for federal work study, then we rely solely on the STEMPS budget to pay for these student assistants. For the school years 2011-2012, the STEMPS budget for student assistants was \$1000 per school year. To provide adequate support for Math X and the ILC, we would like this budget to be at least maintained at current levels.

9. Are there any **new** financial needs for the academic year 2014-15?

*(Examples of new financial need might include: new funding needed for upcoming events, new initiatives, changes in curriculum that require new training beyond what staff development can provide, request for release time for something new, etc.)*

YES  NO

**If yes, briefly describe. Provide any data which support these needs.**

We would like to have the fiscal resources to:

- Purchase newer, more advanced graphing calculators which can be rented to students through the department's graphing calculator rental program. We are currently using only TI-83 calculators in the rental program.
- Purchase multiple student editions of some of our textbooks which could be put on permanent reserve in the library. Currently few math classes have no copies or only 1 copy of the book on reserve. Additionally, some classes have instructor's editions on reserve, but these have answers to all of the problems in them, making them unsuitable for student use.
- We would like to have funding to pay for additional staffing in the ILC, allowing us to either increase the hours of operation and or provide additional help during peak hours.
- We would also like to hire additional student assistants via the division budget to work

in the ILC.

### I. Other information pertinent to the program.

In the space below, discuss any other information which is pertinent to the program. Examples include

1. Internal or external impacts on program
2. (e.g., mandates from state, curriculum changes in one program that impact another, loss of resources due to budget cuts, changes in college mission, goals, etc.)
3. Other internal or external data (*data not discussed above*)

Impacts:

Implementation of stricter repeatability limits: In 2012-13 we worked with Student Services to identify equivalent courses, both at LPC and with LPC and Chabot, and have this information captured correctly in Banner in response to the new State repeatability mandate. Students are currently being blocked from registering after three attempts to pass equivalent courses. This has had a significant impact on the Mathematics Department, as many students struggle to complete mathematics courses and, in the past, it was not uncommon for students to take mathematics courses more than three times, especially in the basic skills courses. Our efforts to increase student awareness of this policy are described in III.B.

ILC Staffing: cuts in course offerings and loss of F hours have forced us to significantly reduce the number of hours the ILC is open and the number of staff available during peak hours. In 2005 the ILC was open 58 hours/week; in 2011-12 it was open 40.5 hours/week. We open later and close earlier, making it more difficult for students to meet their TBA lab hour obligation. In addition, we have only one faculty member scheduled for most of the hours, making it difficult to meet student demand during peak use hours.

Adapting to Technological Change: The student body has changed dramatically over the last five years, as has technology and their desire to use it. We must adapt to these changes and determine how to respond.

### III. SUMMARY

#### A. Summarize objectives accomplished since the Program Review Update (2012)

*(The 2012 Academic Program Review Updates can be found on the Grapevine*

<http://grapevine.laspositascollege.edu/programreview/ipr2010-11.php>

*(Click on your discipline name.) Your brief discussion may include objectives accomplished since the 2010 program review, even if not discussed in the Update.)*

- A portion of the Math X revamp was completed, thanks to a grant from Basic Skills Committee. These improvements included, but not limited to: eManipulatives that allow students to explore historically difficult concepts such as fractions and

translations; additional personalized review and assessments to help students prepare for examinations.

- The SLO's and the assessment process for all mathematics courses was modified to improve consistency and accuracy.
- New state repeatability mandates were addressed in all courses. The mathematics department embarked on a massive educational campaign, but announcing repeatedly in every section the new policy and including it in every syllabus. Last year we worked with Student Services to identify equivalent courses, both at LPC and with LPC and Chabot, and have this information captured correctly in Banner in response to the new State repeatability mandate. Students are currently being correctly blocked from registering after three attempts to pass equivalent courses.
- New state restrictions went into place regarding collecting apportionment for TBA Lab Hours. Several of our math faculty were audited and had to provide significant documentation showing that students attended the ILC for at least one hour within the first two weeks of school and prove that our lab hours contained essential content that was beyond the scope of the in-class materials and homework. In the Spring 2013 we had every mathematics section with a TBA lab hour review the regulations with students and collect a detailed TBA Lab hour contract stating what the students' schedules were and when they planned on completing their TBA hour.

**B Summarize objectives not accomplished since the program review update (2012) and why not.**

*(Your brief discussion may include objectives not accomplished since the 2010 program review, even if not discussed in the Update.)*

Objectives not accomplished since the Program Review Update (2012) are:

- Facilities request for a new Math Center, as described above briefly in the Facilities Resource area (G) and extensively in our Program Review Update of 2012
- A major part of the program development described in our 2010 Program Review and the 2012 Update focused on the need to revamp the Math X program. Completion of this project requires release time and increased instructional assistant support. We have been stymied in our efforts to complete this project due to budget cuts. We are looking for other ways to find support for remodeling of this program.

**C. What are the objectives for the academic year 2014-15?**

*(Summarize briefly the objectives you plan to accomplish or begin in 2014-15. You will describe your plan to implement/achieve these objectives in the Program Effectiveness Plan in Part IV.)*

- Move forward in our revamp of the Math X program. In future years we will continue to seek ways to gain release time to increase student success using the technology we currently have and to accelerate their pathway through the

material. But for next year we specifically, we will focus on getting the support needed for students to successful and our program to be maintained.

- We need to restore the level of instructional assistant support to the Math X Program. Currently we offer only five sections of Math X and have only one part-time IA to help provide support for 43+ students per section and a faculty member.
- A Math X Faculty Coordinator, with 1 unit of release time, is needed to coordinate the courses offered in this mode. Math 107, Math 65, Math 55 and Math 71 are all currently offered in this mode. As materials, assessments, training and supports change, a faculty member is needed to coordinate the efforts and details.
- Research successful algebra review support courses offered at the community college level with the goal of implementing one at LPC in the future. Conversations have already started with Administration, identifying that there is a need for this course but how to design and implement such a course(s) unknown. We hope this will be done through a sabbatical leave for Kristy Woods.
- 

**D. For all needs identified in Part II, summarize how these needs will affect student learning/achievement and impact the program.**

*(This brief summary should capture the effects on students and the program if the needs are met or unmet.)*

1. SLO's: We have identified SLO's with low proficiency levels. The need is to improve instructional materials to better support student learning. Meeting this need should lead to improved student learning of the SLO's. The Department plans to hold meetings where we will share best practices for teaching these SLO's.
2. FTEF: There is a critical need to expand the number of sections offered in key transfer-level courses (Statistics, Math 34 and 38). With 70-75% of our students having transfer as a goal, these are critical courses for reaching that goal. Most liberal arts majors take Statistics as their transfer level math; Math 34 is required for business majors; Math 38 is the first course in the STEM math sequence leading to Calculus. Students cannot progress if they are unable to enroll in these courses.
3. Staff Development/Part-time Involvement: we need to support (through the use of stipends) the inclusion of part-time faculty in departmental meetings. At the SLO meeting we held to discuss the SLO data, only three (of the 30) adjunct faculty attended. Better participation by part-time faculty will improve student achievement of student learning outcomes, collection of SLO data, and implementation of policies.
4. Data: while the data provided was a useful base for discussion, it was even more useful as a tool for showing us we needed more detailed data in some areas. Having specific data questions answered will help us understand where specific student learning needs are and design solutions that will help us meet those needs, leading to improved completion and mathematical proficiency.
5. Math X: Increasing Instructional Assistant support, having a designated Math X

coordinator, and providing training for both IA's and Faculty in Math X best practices will lead to improved student retention and completion, better planning, and a proactive (rather than reactive) approach to designing improvements and new offerings within Math X. The program will be able to adapt to changing demographics and technology, and grow to meet new needs. If these needs are unmet, we will continue to struggle to provide adequate support for students in the classroom, negatively affecting student learning and completion.

6. Research: an identified need is to be current with state norms, such as the Common Core Standards, and innovations in pedagogy, such as alternative pathways in algebra. Sabbatical leave is being requested (by Teri Henson) to do research in these areas and make recommendations to the department. Her recommendations may have significant on what we offer and how we offer it.
7. ILC Staff: We need to expand the operating hours of the ILC and provide additional staffing during peak hours. This will enable us to better meet student need.
8. Algebra Review Course(s): we need to have algebra review course(s) offered at LPC to support students in retaking the placement exam and testing into a higher math course and/or to assist students in strengthening their knowledge between/before attempts at a math course.

**Continue to the next page to complete the form.**

Name of Program	Division	Author(s)
Mathematics	STEMPS	Kristy Woods, Teri Henson

#### IV. PROGRAM EFFECTIVENESS PLAN

**Instructions:** In the table below, indicate how you plan to measure the effectiveness of each objective summarized in Part III and the resources needed.

**Suggested: 0-5 Objectives** (focus on a few)

Rank	Priority 1=essential 2=important 3=nice to have	Objective	SLO's/SAO's linked to objective	College goal(s) linked to objective‡	How will effectiveness be measured?	Category*	Resources needed	Committee
1	1	Restore instructional assistant support in the Math X Program	All of the Basic Skills Courses SLO's		SLO data can be compared to sections offered in different modes of an equivalent course; student completion and retention should improve	<a href="#">Click here to enter text.</a>	Human Resources	RAC
2	2	Math X Coordinator	All of the Basic Skills Courses SLO's		SLO data can be compared to sections offered in different modes of an equivalent course	<a href="#">Click here to enter text.</a>	Faculty release time	<a href="#">Click here to enter text.</a>
3	1	Research Algebra Review Course models	All of the Basic Skills Courses SLO's		Students having completed the Algebra Review course should place higher in a placement exam.		Faculty Sabbatical and/or reassign time	Sabbatical Leave Committee
4	<a href="#">Click here to</a>	<a href="#">Click here to</a>	<a href="#">Click here to</a>		<a href="#">Click here to</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>

Name of Program	Division	Author(s)
Mathematics	STEMPS	Kristy Woods, Teri Henson

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<b>5</b>	Click here to enter text.	Click here to enter text.	Click here to enter text.		Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.

\*human, technological, facilities/supplies, financial, other

‡When College Goals become available, this column will be activated.