

PROGRAM REVIEW Fall 2019

Program: Mathematics

Division: STEM

Date: October 21, 2019

Writer(s): Ashley McHale and Full-Time Math Department Faculty

SLO/SAO Point-Person: Jennie Graham

Audience: Deans, Vice Presidents of Student Services and Academic Services, All Planning and Allocation Committees. This document will be available to the public.

Uses: This Program Review will be used to inform the campus and community about your program. It will also be used in the processes of creating Division Summaries, determining College Planning Priorities and allocating resources. A final use is to document fulfillment of accreditation requirements.

Please note: Program Review is NOT in itself a vehicle for making requests. All requests should be made through appropriate processes (e.g. Instructional Equipment Request Process) or directed to your dean or supervisor.

Time Frame: This Program Review should reflect on program status during the 2019-20 academic year. It should describe plans starting now and continuing through 2020-21. This document also provides the opportunity to describe more long-term plans (optional).

Sections: The first section of this Program Review focuses on general program reflection and planning. The second section has specific questions to be filled out by all programs this year. The third section is a review of curriculum. The fourth section is a review of data for CTE programs. Only programs with curriculum need to complete Section 3, and only CTE programs need to complete Section 4.

Topics: The Program Review Glossary defines key terms. Writers should review this glossary before writing: <https://bit.ly/2LqPxOW>

Help: Contact Karin Spirn: kspirn@laspositascollege.edu

Instructions:

- 1) Please respond to each question as completely as possible.
- 2) If the requested information does not apply to your program, write "Not Applicable."
- 3) Optional: Meet with your dean to review this document before October 21.
- 4) Send an electronic copy of this form to Karin Spirn and your Dean by October 21.

Links:

Program Review Home Page: <https://bit.ly/2Y0j7fW>

Fall 2018 Program Review Updates : <https://bit.ly/2GIWzsM>

Frequently Asked Questions: <https://bit.ly/2DHLnfj>

Section One: Program Snapshot

No Significant Changes Option

Contact person: _____

By marking an X in the box above, the writers of this Program Review indicate that there have been no significant changes to their program or their program's needs in the past year. In this case, programs may opt not to complete Program Review Section One: Program Snapshot. **Programs must still complete all other sections (as applicable).**

Please note: Choosing this option means that your program's information may not be included in the yearly Division Summary.

The No Significant Changes Option may only be used for two years in a row; after two years, programs must complete a full Program Review including the Program Snapshot. Our program's most recent Program Snapshot was submitted in the following semester: Fall 20_____.

- A. **Program Description: Briefly describe your program, including any information or special features of your program that will provide helpful context for readers of this Program Review.**

Examples of program descriptions can be found here: <https://bit.ly/2VwjNvZ>

The Mathematics Department serves many students at LPC with courses from Prealgebra (Math 107) through Differential Equations (Math 5), and various options for transfer-level courses (Math 47, 40, 30, 33, 34, 39, 1, 2, 3, 5, 7, 10). Our courses are requirements for general education for AA/AS and transfer, as well as prerequisites for other disciplines in sciences and business with some intensive mathematical understanding. As a department, we offer students a variety of math classes, modes of offering courses and learning supports. Below are some of what we offer students each semester:

Our AD-T in Mathematics provides students the ability to earn an AS on their way to a transfer school.

NONCREDIT: NMAT courses are being offered this year for the first time. In our basic skills classes, students can choose whether to earn credit (MATH 107, MATH 110, MATH 50, MATH 55), or tuition-free noncredit (NMAT 207, NMAT 210, NMAT 50, NMAT 55), as well as in our concurrent support classes (MATH 100C, MATH 101C, MATH110C, MATH 55C, NMAT 200C, NMAT 201C, NMAT 202C, NMAT 210C, NMAT 255C)

Math Jam is now a noncredit program (NMAT 260A & B, NMAT 261, 262, 263, 264, 265) with noncredit certificates, and MATH 66 (0.5 unit) is a new Math Jam course to prepare for all levels of Calculus. The new Math Jam courses were offered for the first time this fall!

Variety of Learning Modes for our basic skill courses: From face-to-face classes to Emporium to Hybrid, students have choices in how they want to complete a course. Some of our face-to-face instructors have focused on infusing their sections with more active learning and growth mindset language and attend monthly Friday Math Initiative Meetings. The Emporium mode includes streamlined learning that focuses on each student individually and customizes the work to what they need to master while infused with learning supports such as growth mindset and study strategies. Our hybrid modes offer students with a one-day a week, flipped class offering (MATH 55, MATH 40) and test only (MATH 40, MATH 34). Hybrid MATH 34 was added this fall, and hybrid MATH 34 and MATH 40 classes are being aligned to be submitted for the OEI in the near future.

The Integrated Learning Center/Math Learning Center in Room 601 is now being used for concurrent support classes. TBA Lab Hours are no longer part of our Math classes, but several classes (MATH 30, 39, 47) have attached lab hours instead. This change allows us to offer concurrent support courses, which are essential for students being placed higher as a result of AB 705.

SMART Shops are now encouraged by many of our math instructors, for credit or extra credit. Math offers several in our discipline: Math Test Preparation, Conquering Math Anxiety, Problem Solving, How to use a Graphing Calculator and Excel for Statistics.

The Math Department is dedicated to Middle College and ensuring that high school students have a positive experience in our math classes. As AB 705 gets implemented in the fall, we will continue to work with the Middle College coordinator to provide quality education to all of our students..

Our department has teamed up with local Livermore High Schools to offer free one-on-one tutoring for high school students in math on our campus. Since these high school students are now enrolled LPC students, they get access to our library and Wheels-Bus FreeRide program.

We meet regularly with our local Tri-Valley High School Math Teachers and Coaches to discuss alignment of curriculum, pathways, placement and success and retention.

We are also offering a section of year-long Calculus III at our local Amador Valley High school. This class may move around to any of the local Livermore/Pleasanton/Dublin High Schools. This class is open to any student but marketed to our local high school students as concurrent enrollment. This section has had consistently high enrollment and success rates.

Engineering Tech Cohort has an accelerated math component where students complete Intermediate Algebra, College Algebra, and Trigonometry in two semesters. This section has also been heavily contextualized in STEM applications and has a strong learning community component. It has been highly successful in terms of success and retention.

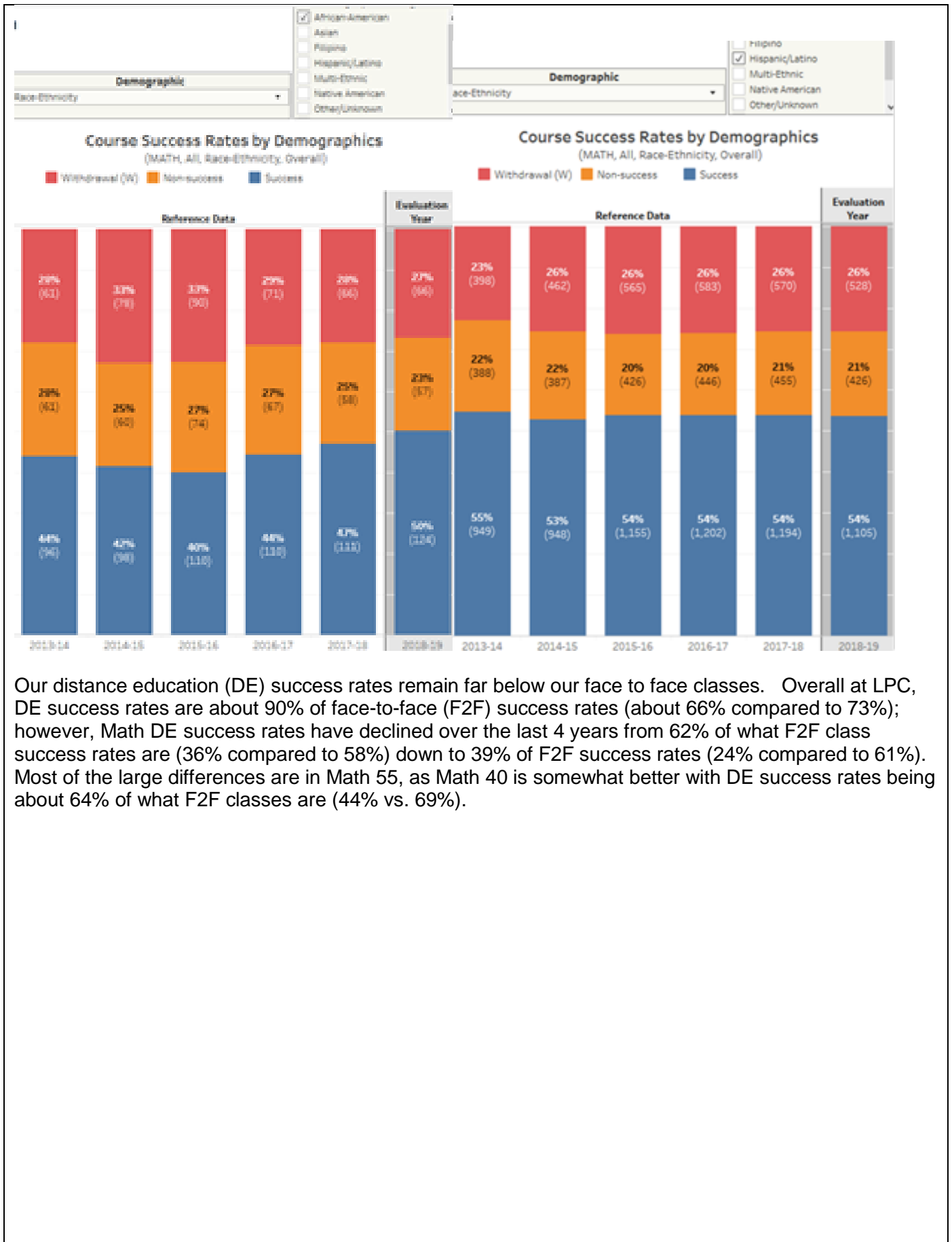
Honors Projects are available to students in transfer level math courses, allowing students the opportunity to complete a challenging application in their target course, earn honors credits that are transcribed and transferable.

Our student Math Club/Honor Society is highly engaged. Our president was a keynote speaker at the Tahoe CMC³ conference spring 2018, and we have regularly had a group of students attending! The club has regular meetings including talks by faculty, and has hosted a series of Math Public Lectures with speakers from local industry.

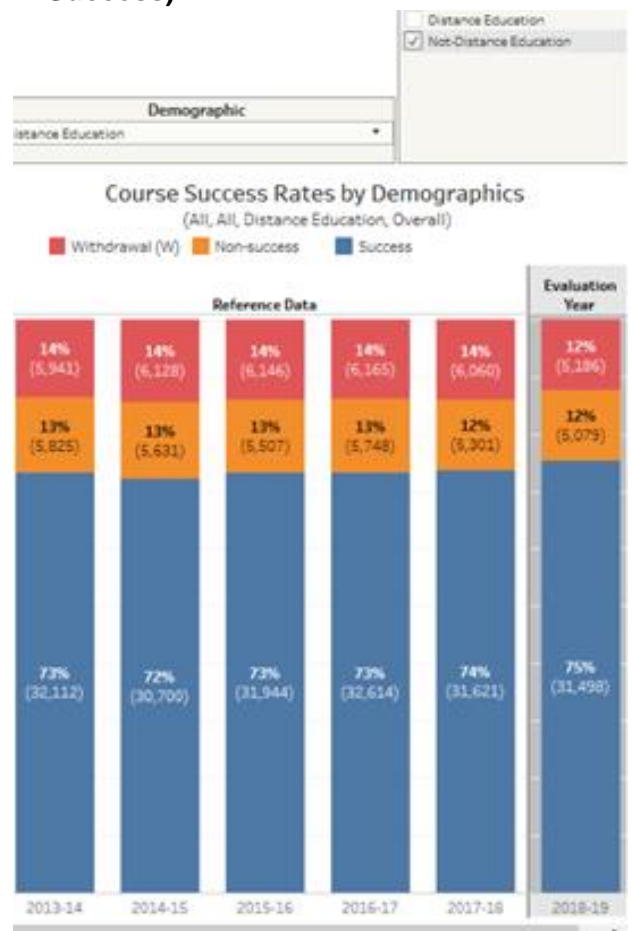
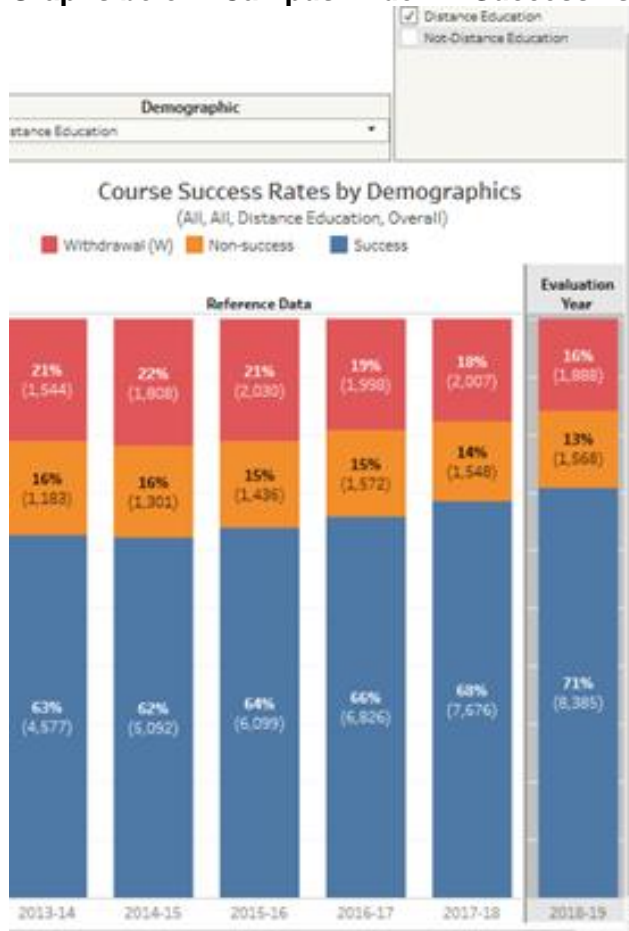
AMATYC Exams are offered each fall and spring semester and up to 150 students participate each year. Our students have consistently performed well with our best performance being in 2018 when as a school we placed 7th in the nation!

Math Department Scholarships are awarded from donations by our math faculty to students ranging in math sophistication that have shown true academic integrity and passion. We also offer a Math Jam Excellence in Tutoring Scholarship.

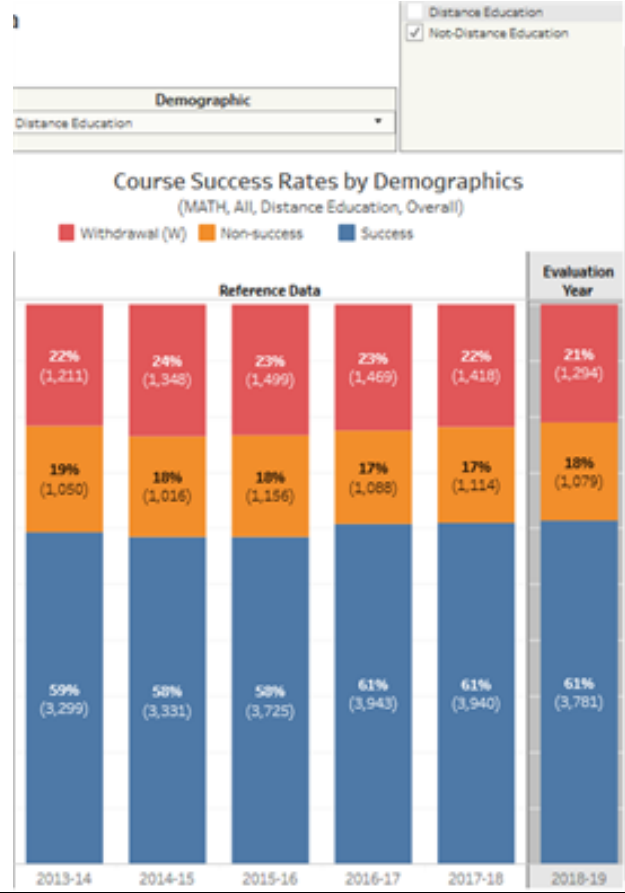
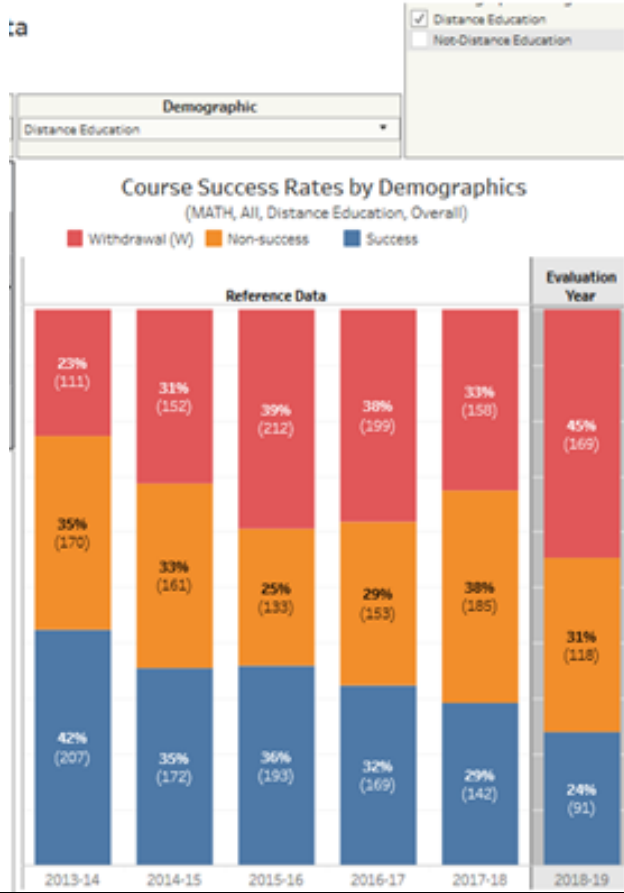
Calculator Rental Program allows students to rent a graphing calculator, worth around \$120, for \$30 for the semester. The program provides an affordable alternative to buying a calculator for many students. To make it even more affordable, we are considering how much we can lower the cost to students while keeping the program sustainable.



Graphs below: Campus Wide DE Success vs. Non-DE Success)



Graphs below: MATH DE Success Rates vs. Non-DE Success)



MATH Course Success Rates: Course-Level Detail (**Academic Year**)

		Reference Data										Evaluation Year		
		2013-14		2014-15		2015-16		2016-17		2017-18		2018-19		
		Num	Pct.	Num	Pct.	Num	Pct.	Num	Pct.	Num	Pct.	Num	Pct.	
MATH 40	Education	Non-success		36	24%	28	16%	22	13%	34	24%	18	17%	
		Withdrawal (W)		50	33%	67	37%	76	43%	53	37%	40	39%	
		Total		150	100%	180	100%	176	100%	142	100%	103	100%	
	Not-Distance Education	Success		606	62%	661	63%	772	68%	810	70%	831	69%	
		Non-success		145	15%	138	13%	151	13%	133	11%	141	12%	
		Withdrawal (W)		226	23%	246	24%	220	19%	221	19%	241	20%	
	Total		977	100%	1,045	100%	1,143	100%	1,164	100%	1,213	100%		
MATH 55	Distance Education	Success	60	34%	54	34%	41	23%	45	26%	41	23%	30	22%
		Non-success	59	33%	45	28%	46	26%	54	31%	78	44%	42	30%
		Withdrawal (W)	60	34%	61	38%	89	51%	73	42%	58	33%	66	48%
		Total	179	100%	160	100%	176	100%	172	100%	177	100%	138	100%
	Not-Distance Education	Success	619	57%	595	54%	752	60%	518	56%	400	53%	292	51%
		Non-success	225	21%	241	22%	246	20%	177	19%	136	18%	142	25%
	Total	1,095	100%	1,104	100%	1,258	100%	919	100%	749	100%	571	100%	
MATH 65	Distance Education	Success	66	40%	54	31%	67	37%	46	27%	46	28%	3	13%
		Non-success	74	45%	80	46%	59	32%	77	45%	73	44%	7	29%
		Withdrawal (W)	26	16%	41	23%	56	31%	50	29%	47	28%	14	58%
		Total	166	100%	175	100%	182	100%	173	100%	166	100%	24	100%
	Not-Distance Education	Success	427	57%	450	59%	452	58%	469	63%	345	49%	13	50%
		Non-success	181	24%	169	22%	192	25%	163	22%	149	21%	6	23%
	Total	748	100%	763	100%	783	100%	750	100%	705	100%	26	100%	

Mark an X before each area that is addressed in your response.				Definitions of terms: https://bit.ly/2LqPxOW			
	Community Partnerships/Outreach		Facilities, Supplies and Equipment, Software		LPC Planning Priorities		Services to Students
X	Course Offerings		Financial/Budgetary		LPC Collaborations		SLO/SAO Process
	Curriculum Committee Items		Human Resources		Pedagogy	X	Student Equity
	External Factors		Learning Support		Professional Development	X	Technology Use

C. Other Data Review (Optional): Describe any significant findings based on other data regarding your program. Possible sources of relevant information might include, but are not limited to, the following:

- Data generated by your program
- CEMC Data
- Labor Market Data

Mark an X before each area that is addressed in your response.			Definitions of terms: https://bit.ly/2LqPxOW				
<input type="checkbox"/>	Community Partnerships/Outreach	<input type="checkbox"/>	Facilities, Supplies and Equipment, Software	<input type="checkbox"/>	LPC Planning Priorities	<input type="checkbox"/>	Services to Students
<input type="checkbox"/>	Course Offerings	<input type="checkbox"/>	Financial/Budgetary	<input type="checkbox"/>	LPC Collaborations	<input type="checkbox"/>	SLO/SAO Process
<input type="checkbox"/>	Curriculum Committee Items	<input type="checkbox"/>	Human Resources	<input type="checkbox"/>	Pedagogy	<input type="checkbox"/>	Student Equity
<input type="checkbox"/>	External Factors	<input type="checkbox"/>	Learning Support	<input type="checkbox"/>	Professional Development	<input type="checkbox"/>	Technology Use

D. Accomplishments: What plans from the [2018 Program Review](#) or any [previous Program Reviews/Updates](#) have been achieved and how? You may also describe achievements that were not planned in earlier Program Reviews. Please highlight any positive impacts to students.

The department has seen significant changes in enrollment with our courses; primarily more students wanting to take our STEM Pathway and transfer classes and fewer students needing basic skills. We have had to add sections of statistics (Math 40) and Calculus 1 (Math 1) to accommodate the increase, and cancel a section each of Intermediate Algebra (Math 55) and Core Intermediate Algebra (Math 50). Much of this shift can be attributed to the more significant use of High School Data to place students into their classes.

College Algebra for STEM (Math 30) has replaced our Precalculus (Math 20) course in the calculus prerequisite, and provide more flexibility to students in that they can take Math 30 or Math 39 Trigonometry concurrently or in any order to get to Calculus 1. Also, we have allowed additional measures for students to gain entry into Math 1 (Calculus): either a C, B, or A in Calculus AB/BC in high school, or a 3.0 overall GPA PLUS C, B, or A in Precalculus in high school. Students can get the Math 1 prerequisite waived by taking their transcript to the Assessment Center.

Corequisite and Fast Track: In fall 2018, the department piloted corequisite support courses for Math 55 and Math 110 (Elementary Algebra) for students who were eligible for that class's prerequisite (that is, a student eligible for 110 could take a specific section of 55 with a corequisite support course, 55C). These served as a model for the concurrent support classes we now offer at all levels up through Calculus.

In spring 2019, we piloted one Fast-Track path of a STEM cohort of Math 30 followed by Math 39 in two 8-week sessions. This was highly successful and we are continuing to offer fast track courses this fall.

Our department members have attended many workshops, conference breakouts, and webinars, as well as collaborated with many other math departments across the state to plan for the massive redesign due to AB 705. Our curriculum for concurrent support courses - intended to help students with the just-in-time remediation as well as student skills, growth mindset, affective domain activities – has been approved and they are being offered for the first time fall 2019. The Math Learning Center is

housing these support courses that will be similar in structure and design to our highly successful Math Jam. The courses are mirrored, meaning students can choose credit or noncredit, and both types of students are in the same classroom with the same experience.

We no longer offer face-to-face sections of Prealgebra (Math 107) as this course will only be offered in Emporium; face-to-face sections of Math 110 have been severely reduced (only one lecture section per semester), and Math 50 and 55 have also seen significant reduction in lecture offerings. From spring 2019 the Emporium mode has the same courses offered during all 8 sections (last year there were 4 sections devoted to Math 107 and the Technical Math sequence -72A, 72B, 72C, 72D, 52A, 52B, 53A, 53B; and 4 sections devoted to Math 55 and Math 110), providing our students with more time options.

The Emporium mode requires intrusive help for students, and we have hired a full-time senior level instructional assistant to help with running and overseeing the operations in this area. In summer 2017, however, the Sr. IA resigned and a search for a replacement began. Last year, after previously being denied, we were able to hire a replacement (Paula Rose). We also hired an additional 10 hr/week IA (Michelle Kumamoto).

Last year, we hired a STEM Coordinator (Jean O'Neil Oparari). Given the lack of faculty release, we knew this was a position needed to be able to sustain Math Jam and other important initiatives within the STEM Division.

Last year, we lost one full time faculty, Craig Kutil, as he was hired as the full-time Articulation Officer. There is desperate need need to hire a replacement for Craig and a new (NOT replacement) full-time faculty. We have submitted these proposals through the Faculty Hiring process. Several new part-time faculty have also joined our growing department, which is typical each semester.

Mark an X before each area that is addressed in your response.				Definitions of terms: https://bit.ly/2LgPxOW		
	Community Partnerships/Outreach		Facilities, Supplies and Equipment, Software		LPC Planning Priorities	Services to Students
X	Course Offerings	X	Financial/Budgetary		LPC Collaborations	SLO/SAO Process
X	Curriculum Committee Items	X	Human Resources		Pedagogy	Student Equity
	External Factors	X	Learning Support	X	Professional Development	X Technology Use

G. Uncompleted Plans: What plans from your 2018 Program Review have not been achieved and why?

Although all of our short-term goals as outlined in the 2018 Program Review have been achieved, there are still long-term goals that need to be met.

Some progress has been made in moving our first-level transfer courses into the OEI. Math 34 is being offered DE for the first time this semester and one instructor will be submitting Math 40 for OEI review shortly. Our department will need a suitable means of proctoring exams before we can fully implement OEI for all of our desired courses. We are waiting for more advances to be made in proctoring software and for a full proctoring center to be established on our campus.

Professional development remains an ongoing issue in our department. The urgency for more training depends on several factors, including the course being taught (those most affected by AB 705 are in

greater need of additional support) and the level of experience each instructor brings to the specific course. Our department has started a monthly community of practice for our concurrent support instructors and a SCFF project has been proposed requesting funds for more professional development for part-time faculty to begin next year.

As part of our planning and roll-out last year of new concurrent support courses and revised Math Jam courses, we plan to analyze student success and retention rates in the first-transfer level courses affected by AB 705. We will be gathering quantitative and qualitative data to determine how to improve the program and inform discussions about whether to keep the concurrent support optional or required and if required what criteria to use to maximize student success.

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	Community Partnerships/Outreach		Facilities, Supplies and Equipment, Software		LPC Planning Priorities	Services to Students
X	Course Offerings		Financial/Budgetary		LPC Collaborations	SLO/SAO Process
	Curriculum Committee Items		Human Resources		Pedagogy	Student Equity
X	External Factors		Learning Support	X	Professional Development	XTechnology Use

E. Challenges, Obstacles and Needs: Describe any significant challenges, obstacles or needs for your program. Please highlight any negative impacts for students.

With the implementation of AB 705, demand for our Math 40 (Statistics) courses have increased greatly. We have added a large number of new sections this semester in order to address this demand, but do not currently have access to enough computer lab classrooms. Our department will need more facilities with the necessary computers to meet the state-mandated technology learning outcomes for our statistics courses.

We expect our student population to be rougher and more underprepared, and we may see success rates plummet in our courses (this has been shown by some of the “early adopters” of direct placement into transfer-level math - first year success data is low). Our faculty (especially part-timers) desperately need professional development in active learning and best practices in teaching math. Faculty should be encouraged and incentivized to change their teaching styles to better suit the needs of our students. One example of how to incentivize professional development is to allow part-time faculty to participate in meaningful, directed professional development as their required professional responsibility hours each semester. Active learning workshops such as OnCourse should be offered and encouraged on Mandatory FLEX day, instead of ad-hoc during the semester.

The mathematics department is in need of support from instructional assistants to support the expected growth in our concurrent support courses. These courses, designed to assist struggling students taking more advanced mathematics due to AB 705, require that faculty and tutors give significant one-on-one attention to students during class time. In addition, a lot of logistic support is needed to keep the course organized; for example, students regularly arrive to enroll in NMAT 202C (an open entry/open exit

course with registration open for most of the semester) and require orientation to the course. The presence of an IA will allow us to increase our enrollment capacity for the class and maximize instruction time between faculty and students.

Persistence has been a major issue among Las Positas students struggling in their math classes. Over the 2017-2018 Academic Year, 65.4% of students who either withdrew from or failed their math class did not take a math class at LPC the following semester. To make matters worse, over the 2017-2018 Academic Year, 29.8% of students who either withdrew from or failed their math class did not return to LPC period the following semester. We expect retention to become an even larger issue this year as we implement AB 705 because students will be taking transfer-level classes with weaker backgrounds in the prerequisite material than before. Our faculty will need professional development to help them guide students through these more advanced classes. In addition, students will need proactive counseling and support, such as an inreach campaign, to help them navigate the courses and encourage them to persist.

This semester, we have introduced a large number of new courses, pathways and certificates. Our department has faced a number of obstacles in implementing these courses through Banner; for example, a coding issue prevents us from enforcing the corequisite requirements for our concurrent support courses as indicated on their course outlines of record. We will need additional support from Academic Services to help us offer these classes as they were designed and approved through the shared governance process.

As a temporary measure, the testing room in the Math Emporium is serving as a proctoring center for math instructors who would like to schedule a limited number of makeup exams for individual students. This does not reduce our department's need for a new, full, proctoring center in order to support having a growth mindset in taking and grading exams for our faculty. Students cannot easily re-take a missed exam; faculty have to coordinate time with students (sometimes several students) which can be difficult if not impossible for our part-time faculty teaching at other schools.

Once the HSI grant runs its course (this marks year 5 of 5) there will be no reassigned time for coordination of the Math Emporium, Concurrent Support, or Math Jam. All of these areas require extra time and commitment outside of a faculty member's usual professional responsibilities. Each needs to be granted a measure of reassigned time in acknowledgement of the work that is being done to support these areas on top of the faculty member's contractual obligations. The quality of work that is currently happening may not be able to continue due to workload concerns.

Mark an X before each area that is addressed in your response.				Definitions of terms: https://bit.ly/2LqPxOW		
	Community Partnerships/Outreach		Facilities, Supplies and Equipment, Software		LPC Planning Priorities	X Services to Students
X	Course Offerings	X	Financial/Budgetary		LPC Collaborations	SLO/SAO Process
X	Curriculum Committee Items	X	Human Resources	X	Pedagogy	X Student Equity
	External Factors	X	Learning Support		Professional Development	Technology Use

H. Short Term Planning: What are your most important plans (either new or continuing) for next year? Describe plans starting now and continuing through AY 20-21.

Short-term Planning includes:

Hold campus-wide discussions on success data in Math due to AB 705, and decide whether to require the concurrent support courses and what criteria to use.

Hold regular department discussions on equity and how we can better serve our students, particularly students under disproportionate impact.

Mark an X before each area that is addressed in your response.				Definitions of terms: https://bit.ly/2LqPxOW		
	Community Partnerships/Outreach		Facilities, Supplies and Equipment, Software		LPC Planning Priorities	Services to Students
x	Course Offerings		Financial/Budgetary	x	LPC Collaborations	SLO/SAO Process
	Curriculum Committee Items		Human Resources	x	Pedagogy	x Student Equity
	External Factors		Learning Support	x	Professional Development	Technology Use

I. Long Term Planning (Optional): Please detail any long-term plans for the next 3-5 years. (Only if you have significant plans, such as implementation of a grant project, creation of long-term initiatives including those using restricted funds such as Equity or SSSP, construction and outfitting of a new building).

Over the summer, Math faculty submitted a Math 40 DE course to the OEI and it is currently pending approval. In addition, for spring 2020, our only hybrid Math 55 course was cut due to low success rates. We are concerned that cuts such as this one could impact our ability to reach students who need DE/Hybrid courses. The OEI carries strict guidelines for course quality and content, so perhaps submitting a 55 through the OEI process could enhance the course quality and in turn increase the success rates. We will carefully evaluate this decision in light of AB 705 as we don't have the same student demand as in the past. We offered two sections of Math 34 hybrids in fall and spring of this year. We will potentially consider submitting 34 through the OEI when appropriate. In addition, we are looking to consider developing hybrid/DE versions of other Math courses.

Mark an X before to each area that is addressed in your response.				Definitions of terms: https://bit.ly/2LqPxOW		
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x	Course Offerings		Financial/Budgetary		LPC Collaborations	SLO/SAO Process
	Curriculum Committee Items		Human Resources	x	Pedagogy	Student Equity
	External Factors		Learning Support		Professional Development	Technology Use

Section Two: Current Topics (Required for All Programs)

A. Program-Set Standard (Instructional Programs Only): The program-set standard is a baseline that alerts programs if their student success rates have dipped suddenly. There may be many valid reasons a program does not meet the Program Set Standard; when a program does not meet this standard, they are simply asked to examine possible reasons and note any actions that should be taken, if appropriate.

Program-set standard data can be found on this page:

<http://www.laspositacollege.edu/research/outcomes.php>

(Data for AY 18-19 will be available by the beginning of Fall 2019).

Did your program meet its program-set standard for successful course completion?

yes no

If your program did not meet your program-set standard, discuss possible reasons and how this may affect program planning or resource requests.

N/A

B. SLOs/SAOs: Describe an example of how your program used course SLO data (SLOs) or SAO data from last year (2018-19) to impact student learning, access, achievement, or other services to students. (Copy the box below if you would like to discuss multiple examples).

Course (SLOs only): Math 5 - Ordinary Differential Equations
SLO or SAO: Upon completion of Math 5, a student should be able to use a 4th order Runge-Kutta algorithm to solve an equation numerically.
Describe the quantitative or qualitative results: The overall trend based on the data is that the majority of the students have an above average to mastery level knowledge of the SLO topics.
Discuss any actions taken so far (and results, if known): The actions taken so far have been to use technological collaborative labs for Runge-Kutta and traditional book homework and lecture techniques for the others.
Discuss your action plan for the future: Based on instructor reflections, more labs should be developed. A large majority of students have performed very well on the Runge-Kutta SLO for years. It is recommended to keep all of our current SLO's for Math 5 except for the technology based Runge-Kutta one. The next technology SLO used for Math 5 should be one connected to one of the new labs that instructors wish to develop.

Course (SLOs only): Math 1- Calculus I

SLO or SAO: Upon completion of Math 1, a student should be able to find the volume of a solid of revolution using washers or shells.

Describe the quantitative or qualitative results:

Slightly more students achieve mastery level of understanding of Volume of Solids in the fall (28.40%) than in the spring (23.71%). Almost 12% more students achieve average and above average in the spring than those in fall.

Discuss any actions taken so far (and results, if known):

Volume of Solids: One instructor indicated that an additional day was taken to introduce volume of solids - a day on disks and a day on washers - with notable success.

Discuss your action plan for the future:

Volume of Solids: Many instructors expressed wanting to take more time to cover the topic. Perhaps, adjusting pacing to allow for a second day and/or time to assess the SLO once before the final exam. It was also noted that it seems that many instructors are searching for an ideal tool for visualization (via technology or other). It is incredibly valuable to invest time into instruction of this SLO as Math 2 picks up exactly where Math 1 leaves off.

A common theme that was noted for most SLOs that centered on topics that are covered at the end of the semester was that students did not perform well on them. It was noted that this could be due to many reasons, first among them though was needing to rush through material at the end of the semester to make sure all of the topics are covered.

Course (SLOs only): Math 39 - Trigonometry

SLO or SAO: Upon completion of Math 39, a student should be able to solve a trigonometric equation that does not involve any of the standard angles as solutions, making usage of a calculator necessary.

Describe the quantitative or qualitative results:

Significant decrease in achievement from fall to spring, with above average percentages halved from fall to spring and below average percentages doubled.

Discuss any actions taken so far (and results, if known):

Calculator problems were generally relegated to Lab assignments, with not a lot of time spent during class.

Discuss your action plan for the future:

Several expressions of surprise that students were unable to use calculators correctly; suggestions to spend more time in class demonstrating calculator usage.

It was noted that this SLO is definitely important, especially as technology is becoming more and more integrated into every occupation. Even though the specific tool (a calculator) won't necessarily be needed, gaining familiarity with and comfort using technological devices is a transferable out-of-the-classroom skill.

Having class sets of calculators so all students could see a demo of usage on the particular device they are using would be ideal. The library does have a class set (I believe), but one is one set for several instructors to share.

For the technology SLO one faculty member noted that he was struck by how often the reflections indicated that the instructor gave a handout or a lab but didn't model the tech usage in class to students and wondered if perhaps faculty need more training (professional development) in this area? Especially in light of comments during the meeting about graphing calculator usage being such a struggle.

Course (SLOs only): Math 40 - Statistics and Probability

SLO or SAO:

Upon completion of Math 40, a student should be able to build a frequency distribution for, and make a histogram of, quantitative data.

Upon completion of Math 40, a student should be able to use a computer program to make a graph of categorical data.

Describe the quantitative or qualitative results:

There was an increase in "Above Average" and a decrease in "Average" from fall 2018 to spring 2019. It was suspected that because this SLO is measuring a topic closer to the beginning of the course that students tend to find easier, there may be at least some students that show up in both semesters in the data. Some may have failed the first time, with their grades dropping off once the class hit hypothesis testing. They may have improved their understanding of frequency distributions from one semester to the next.

Discuss any actions taken so far (and results, if known):

Reflections for these SLOs noted that there seems to be a lot of variety in what instructors would like to do, in order to help students learn the material. Some use handouts, and help to reinforce the topics more on quizzes and exams. Many of the instructors are using different forms of technology (i.e. TI-83/84, Excel, Stat Crunch, Smart Shop Series etc.). Many instructors noted that students actively worked on it in class, in addition to it showing up on a quiz, exam, or final. Some instructors also noted that the frequency distributions and histograms were constructed both by hand, and by using technology like a graphing calculator.

Discuss your action plan for the future:

Most instructors are satisfied with how they introduce and teach these topics. However, during our department discussion it was noted that this SLO is measuring a very specific topic that is used in a wide variety of fields, so it is important, however, it is also a topic that many students are already very familiar with from their previous educational experience. It was felt that it may not fully reflect the level of statistical knowledge that they learn in this course. At the very least, it was felt that having SLOs measuring two topics from the same chapter seems in appropriate for understanding how students are doing in this course. This may be something that leads to an SLO revision or two for this course, especially since there are other technology based topics that students should be comfortable working with and should be being assessed.

Course (SLOs only): Math 50 - Intermediate Algebra for SLAM

SLO or SAO:

Upon completion of Math 50, a student should be able to given a data set, use technology to graph a scatter plot of the data and find the line of best fit (linear regression).

Describe the quantitative or qualitative results:

Tech: spring to spring - mastery+above average+average went down from 86% to 73%;

Discuss any actions taken so far (and results, if known):

It was noted that a few instructors were using summation for least squares regression. This is not appropriate for this class level; should have used technology only.

Discuss your action plan for the future:

Instructors noted that the lesson was at the end of the term and covered "too quickly" - concerns that students didn't have enough time to understand.

It was noted that technology should include Excel and we should encourage M50 instructors to try to use Excel for this class/SLO. It is felt that graphing calculators are cumbersome to teach in class, and one instructor noted that if a student is afraid to ask questions about its use, then it is no better than a paper weight. This topic should not be on a final exam, but as a lab or in-class assignment instead (one is already written for this very topic).

C. Program SLOs (Degree/Certificate granting programs only): Describe an example of how your program used program-level SLO data (PSLOs) from last year (2018-19) to impact student learning or achievement. (Copy the box below if you would like to discuss multiple examples).

Degree/Certificate: We have not started reviewing PSLO data for Math AS-T.

Program SLO:

Describe the quantitative or qualitative results:

Discuss any actions taken so far (and results, if known):

Discuss your action plan for the future:

Not sure that we will look at this. Math is typically focused on getting students through their transfer level math courses and through Calc 1.

D. DLO/SAO Progress Review: SLO and SAO results should be reported at least once every three years. To see if your program is up to date with the creation and assessment of SLOs, please consult the list available here: [this link will be added by the beginning of Fall 2019].

D1. List any courses or services areas that do not have SLOs or SAOs approved. These SLOs/SAOs need to be written as soon as possible; please work with your SLO/SAO coordinator for help submitting new SLOs/SAOs to the SLO Committee.

All of our classes have SLO written for them, but we do have a few that need to have their SLOs entered into eLumen and approved by the committee.

F. Student-Centered Funding Formula (SCFF): The state funding allocation model has shifted to include socio-economic status and student achievement metrics. LPC will begin to be funded by this model by AY 21-22. The district and college are using this opportunity to develop projects that support these funding considerations and the needs of our students. The projects should help LPC achieve the goals listed below.

Goals for SCFF Projects

- Ensuring eligible students receive financial aid, if desired
- Removing barriers that hinder students from moving toward their goals
- Offering additional information and support about educational pathways
- Offering academic support that increases English/math completion in the first year
- Enhancing career readiness through coursework
- Increasing completion of degrees and certificates
- Increasing transfers and transfer readiness

F1. SCFF Actions Taken: Describe one initiative or action your program or area has taken in support of one of the goals in the list above.

- What was the action?
- What was the result, if known?
- If your action or initiative was successful, please explain why and whether it could be used in other areas or scaled for use across the campus.
- If your action or initiative was not successful, please indicate why (lack of resources, unforeseen variables, etc.)
- If you did not take any actions in support of the goals above, you may write “N/A.”

Offering academic support that increases English/math completion in the first year: The department developed concurrent support courses for multiple levels of our math courses (Math 107 through Math 3), in which students can get regular, effective and just-in-time help with their target math courses. Since this was started fall 2019, we have yet to analyze success data, but we are encouraged by feedback from current students taking the support courses.

F2. Future Strategies (optional): Please describe any possible strategies or actions that your program or the college could use to support the goals listed above. What resources would be needed?

Our department has submitted two SCFF proposals to support some of the SCFF goals above.

Proposal 1: Persistence, Retention and a Community of Practice: We would like to pay 14 part-time faculty 2.5 hours/week for 17 weeks each semester, amounting to 595 hours/semester at \$46.92/hour. Based on previous enrollment numbers we anticipate that 500 students will need to be contacted each semester. Anticipating an average of ten minutes of communication time with each student – including phone calls, emails, and replies to emails – means that we would need to employ a student assistant for 90 hours (including approximately five hours for training and orientation). We also require administrative help (e.g. at the Division Office) to assist with paperwork and hiring for these new employees, along with coordination (reassigned time) by a full-time faculty member. Modeling our program after Pierpont Community and Technical College’s findings, we anticipate that approximately 110 students will re-enroll in a math class each semester as a result of this call campaign (a 23% increase in our re-enrollment numbers). We anticipate that roughly half of these students will not have enrolled in college otherwise, comprising 1 FTES per student, and the other half would not have taken a math class, comprising approximately 1/3 FTES per student (assuming that full-time is 12 units and most math courses are 4 units). In addition, we expect that 75% of these 110 students will also enroll

in the noncredit CDCP concurrent support courses designed to help them succeed in their target courses.

Proposal 2: Concurrent-Support Support: The Mathematics department proposes to hire two TEMP On-Call Instructional Assistants (IAs) to help increase student enrollment in our concurrent support courses: Math 66C, Math 100C, Math 101C, NMAT 200C, NMAT 201C, and NMAT 202C. These courses, designed to assist struggling students taking more advanced courses due to AB 705, require that faculty and tutors give significant one-on-one attention to students during the class. In addition, a lot of logistic support is needed to keep the course organized; for example, students regularly arrive to enroll in NMAT 202C (an open entry/open exit course with registration open for most of the semester) and require orientation to the course. Due to the nature of these courses and since they are currently in their pilot year, the department initially capped enrollment at 22 students. We expect demand for these courses to increase, much as they did for Math Jam, a similar course offered during the week before each semester. The presence of an IA will allow us to increase our enrollment capacity for the class and offer it to an estimated 260 more students. It will also allow us to ensure that attendance is fully counted for all of our classes, maximizing any apportionment gained through positive attendance in our non credit sections.

We would like to employ two Instructional Assistants who would each work for 225 hours per semester (75 days max per semester). The hours will align with the times that our concurrent support courses are offered. The presence of these IAs will allow us to increase our enrollment in these courses by 13 students per section for a total of 260 additional students per semester, of which we believe that 50% will choose to take the course non-credit (CDCP). This would give us 9.75 Noncredit FTES per semester and 3.25 Credit FTES per semester. We compute the funding required for our instructional assistants as follows:

450 hours per semester*23.32*1.11(benefits)*1.2(division)*1.05(admin overhead)+\$300 (course supplies, such as photocopies and markers) gives us \$14,976.91 per semester.

FTES = $(260 * 3(\text{hours of class}) * 17.5) / 525 = 26$, with 13 going to non credit CDCP and 13 going to credit.

We will assume that 1/3 of the new students will be Promise and Pell Grant students.

G. Student Equity and Achievement Program: To ensure equitable outcomes for vulnerable student populations, Las Positas College plans to close equity gaps in the areas listed below. For each area/metric, the listed impacted groups have had proportionately lower rates than other groups.*

Area/Metric	Impacted Groups
Access: Enrollment at LPC	Black or African American (Female), Black or African American (Male), Filipino (Female), White (Female)

Readiness: Completion of both transfer-level Math & English	American Indian or Alaska Native (Female), Black or African American (Female), Black or African American (Male), Hispanic or Latino (Male/All), First Generation (Male/All), Foster Youth (Female), Foster Youth (Male), LGBT (All)
Retention: Retention from Fall to Spring	Black or African American (Female/All), First Generation (Female/All), Foster Youth (Male)
Completion: Completion of an Associate Degree, Certificate	American Indian or Alaska Native (Male/All), Asian (Male), Black or African American (Male/All), Native Hawaiian or other Pacific Islander (Female), Native Hawaiian or other Pacific Islander (Male), Foster Youth (Male), LGBT (Female), LGBT (Male)
Completion: Transfer to a Four-Year Institution	Disabled (Male/All), Black or African American (Female), Hispanic or Latino (Male), Native Hawaiian or other Pacific Islander (Female), Native Hawaiian or other Pacific Islander (Male), First Generation (Female), Foster Youth (Male), LGBT (Female)

*The full list of impacted groups with supporting data can be found here: <https://bit.ly/2XZVGDb>

G1. Equity Actions: Describe any actions your program has taken in the past two years (2017-2019) or actions currently in progress to improve the metrics above for the impacted groups listed (for example, to increase the ability for African American students to enroll in classes at LPC, or to increase the ability of LGBT students to complete Associate’s Degrees or Certificates). What has been the effect of these actions, if known?

Math Faculty were surveyed to determine what types of training they have completed recently. Twenty-six part-time and 11 full-time faculty responded. A small portion (22%) of our faculty participated in the “Teaching Men of Color” training from two years ago, while 49% have received some form of Equity-centered training. Sixty-two percent of faculty have participated in active-learning training to improve teaching, and 76% have implemented active learning strategies in their classrooms. Several faculty have implemented Growth Mindset teaching and grading strategies in the classroom, and these permeate our concurrent support courses and Math Jam courses.

We are aware that one of the most significantly impacted groups specifically for math is our African-American population. We are working to help faculty identify best practices in teaching students, specifically our students of color. We have several faculty involved in Equity-based/Equity promoting programs on campus (Guided Pathways, SEA, UndocuAlly), and we will be sharing resources and strategies to other faculty to begin improving our teaching and approachability for students.

G2. Equity Challenges: Describe any challenges your program has faced in promoting equity and equity-based decision making in the metrics listed above (or any other areas).

Mathematicians are very logical; it is inherent in the study of our field. This “Spock-like” logic can be a barrier to authentic care in teaching our students. Faculty sometimes ignore (or are simply choosing to be unaware of) the many outside commitments our students have, and especially our male students of color who are often fighting stereotypes to be in school and working to help their families. Often times, this logic causes faculty to erroneously conclude that mathematics teaching is without discrimination; the mathematics field itself could be thought of as “pure”, but the teaching of it can hold unintended or unknown biases against disproportionately impacted students in our grading policies, late and makeup work, and simple language used in syllabi.

Another significant barrier to promoting equity-based decision making is with our workload. With changes due to AB 705, AB 1885, the OEI, Guided Pathways, and countless other initiatives, our department is suffering from constant evolution. Many of us cannot create the time to have these extremely important, yet difficult conversations.

It is a commitment this year to carve space into our regular meetings for these conversations to promote and encourage best practices for improving equity in our classrooms.

H. Program Review Suggestions (optional): What questions or suggestions do you have regarding the Program Review forms or process?

**Section Three: Curriculum Review
(Programs with Courses Only)**

The following questions ask you to review your program's curriculum. To see the last outline revision date and revision due date:

1. Log in to CurricUNET
2. Select "Course Outline Report" under "Reports/Interfaces"
3. Select the report as an Excel file or as HTML

Curriculum Updates

A. Title V Updates: Are any of your courses requiring an update to stay within the 5 year cycle? List courses needing updates below.

All courses are in compliance with Title V.

(Note: the Course Outline Report does list Math 3 and Math 7 as needing updates, but the report contains erroneous data-- both of those were updated effective fall 2016.)

B. Degree/Certificate Updates: Are any degrees/certificates requiring an update to do changes to courses (title, units) or addition/deactivation of courses? List needed changes below.

All degrees and certificates (for both the MATH and NMAT descriptors) have been updated recently.

C. DE Courses/Degrees/Certificates: Detail your department's plans, if any, for adding DE courses, degrees, and/or certificates. For new DE degrees and/or certificates (those offered completely online), please include a brief rationale as to why the degree/certificate will be offered online.

As we look at enrollment demands for our classes, it may be needed in the future to consider Math 30, Math 39, or Math 1 DE courses for campus and the OEI. These courses are already approved for DE, but we have yet to offer them in any DE/hybrid mode.

**Section Four: CTE Updates
(CTE Programs Only)**

A. Labor Market Conditions: Examine your most recent labor market data. Does your program continue to meet a documented labor market demand? Does this program represent a training need that is not duplicated in the college's service area? (Please note: your labor market data should be current within two years. Contact [Vicki Shipman](#) or the current CTE Project Manager for access to data).

B. Advisory Boards: Has your program complied with advisory board recommendations? If not, please explain.

C. Strong Workforce Program Metrics: Utilizing LaunchBoard, review the Strong Workforce Program Metrics. Review the data and then answer the following questions.

(Contact [Vicki Shipman](#) or the current CTE Project Manager for help accessing the data).

C1. Does your program meet or exceed the regional and state medians **for increased enrollments, completions, and/or transfer since your last program review**? If not, what program improvements may be made to increase this metric?

C2. Does your program meet or exceed the regional and state medians **for students gaining employment in their field of study**? If not, what program improvements may be made to increase this metric?

C3. Does your program meet or exceed the regional and state medians **for student employment rates after leaving the college**? If not, what program improvements may be made to increase this metric?

C4. Does your program meet or exceed the regional and state medians **for increased student earnings and median change in earnings**? If not, what program improvements may be made to increase this metric?