

El Camino Community College

PROGRAM REVIEW 2021-2022

Mathematical Sciences

Committee D



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SECTION 1

Program Overview

A) Provide a brief narrative description of the current program, (e.g., the program’s mission statement, a description of the students it serves) and any highlights of the program’s previous success, future vision, and related needs.

Committee D’s aim is to prepare students for enrollment in transfer-level mathematics courses, that is 100-level courses and above. Committee D has existed for many years and offered many courses from basic arithmetic, prealgebra, basic algebra, several versions of intermediate algebra tailored to students on different educational paths, and several non-credit courses aimed to prepare students for placement exams and some of our courses. Basic algebra and intermediate algebra fulfil the mathematics competency requirement for the AA degree at El Camino College.

With the passage of AB 705 and the recommendations of the Chancellor’s Office, the Department of Mathematics will no longer offer credit-bearing pre-transfer level mathematics courses within the purview of the program starting in the fall of 2022. As a result, the program will spend the next few semesters tracking success rates and examining ways to positively impact student success. One option would be to offer targeted non-credit courses aimed to prepare students for specific courses like statistics, college algebra, precalculus and calculus. These courses could be offered during the summer and winter terms, as well as during the semester as eight-week courses.

B) Describe the degrees and/or certificates offered by the program.

The program does not offer any degrees or certificates.

C) Explain how the program fulfills the college’s mission.

The mission of El Camino College is to make a positive difference in people’s lives by providing comprehensive educational programs and services that promote student learning and success in collaboration with our diverse communities.

The program seeks to prepare students for transfer-level mathematics courses. The program aims to prepare students by instilling good study habits, having high expectations, and helping students meet those expectations.

D) Describe the degrees and/or certificates offered by the program.

The program does not offer any degrees or certificates.

E) Explain how the program fulfills the college’s mission.

The mission of El Camino College is to make a positive difference in people’s lives by providing a comprehensive educational programs and services that promote student learning and success in collaboration with our diverse communities.

The program seeks to prepare students for transfer-level mathematics courses. The program aims to prepare students by instilling good study habits, having high expectation, and helping students meet those expectations.

F) Discuss the status of recommendations from your previous program review.

If more than ten recommendations were presented in the previous program review, expand the enumerated list below as needed.

1. **Recommendation: CMD Recommendation 2016A – pay adjuncts for office hours, professional development and committee work**
Status: Active
Notes/Comments: The Committee continues to recommend that adjunct faculty be paid for office hours, professional development and committee work.
2. **Recommendation: CMD Recommendation 2016B - course coordinators**
Status: Active
Notes/Comments: The Committee continues to recommend all courses have coordinators.
3. **Recommendation: CMD Recommendation 2016C - scheduling based on education plans and research**
Status: Abandoned
Notes/Comments: The Department does not offer courses under the purview of the Committee.
4. **Recommendation: CMD Recommendation 2016D – materials for threads spanning multiple courses**
Status: Abandoned
Notes/Comments: The Department does not offer courses under the purview of the Committee.
5. **Recommendation: CMD Recommendation 2016E – faculty development/best practices**
Status: Abandoned
Notes/Comments: The Department does not offer courses under the purview of the Committee.
6. **Recommendation: CMD Recommendation 2016F – fulltime faculty hires for developmental math**
Status: Abandoned
Notes/Comments: The Department does not offer courses under the purview of the Committee.
7. **Recommendation: CMD Recommendation 2016G – fulltime faculty participation in CMD**
Status: On Hold
Notes/Comments: We plan to continue to work with the other committees in order to better serve our students.

8. **Recommendation: CMD Recommendation 2016H – redesign placement process using multiple measures/research**
Status: Completed
Notes/Comments: The Department uses multiple measures in all placement decisions.
9. **Recommendation: CMD Recommendation 2016I – improve information about multiple pathways**
Status: Abandoned
Notes/Comments: The Department does not offer courses under the purview of the Committee.
10. **Recommendation: CMD Recommendation 2016J – expand effective programs, including math academies, SI, and counselor intervention**
Status: Active
Notes/Comments: We will only look at the math academy courses (17A, 27A 47A) and see how these courses fit in a post AB-705 environment.
11. **Recommendation: CMD Recommendation 2016K – program coordinator**
Status: Abandoned
Notes/Comments: The Department does not offer courses under the purview of the Committee.
12. **Recommendation: CMD Recommendation 2016L – expand our research capacity**
Status: Active
Notes/Comments: We strive to make data-informed decisions and we continue to expand our data collection and analysis capability.
13. **Recommendation: CMD Recommendation 2016M – student advisory group**
Status: Abandoned
Notes/Comments:
14. **Recommendation: CMD Recommendation 2016N – access to transfer-level courses**
Status: Active
Notes/Comments: The Committee continues to recommend that we study ways for students to access transfer-level courses.
15. **Recommendation: CMD Recommendation 2016O – new GTE course**
Status: Abandoned
Notes/Comments: The Department does not offer courses under the purview of the Committee.
16. **Recommendation: CMD Recommendation 2016P – noncredit and corequisite courses**
Status: Abandoned
Notes/Comments: The Department does not offer courses under the purview of the Committee.

17. **Recommendation: CMD Recommendation 2016Q – new pathways with co-requisite support**
Status: On Hold
Notes/Comments: The Committee is continuing to study paths to transfer-level courses.
18. **Recommendation: CMD Recommendation 2016R – normalize competency and challenge tests**
Status: Abandoned
Notes/Comments: The Department does not offer courses under the purview of the Committee.
19. **Recommendation: CMD Recommendation 2016S - include support activities in scheduling and registration**
Status: Abandoned
Notes/Comments: The Department does not offer courses under the purview of the Committee.
20. **Recommendation: CMD Recommendation 2016T – fulltime tutoring coordinator**
Status: Completed
Notes/Comments: A full-time tutoring coordinator was hired.
21. **Recommendation: CMD Recommendation 2016U – improve tutoring**
Status: Abandoned
Notes/Comments: The Department does not offer courses under the purview of the Committee.
22. **Recommendation: CMD Recommendation 2016V – classroom computing and flexible classrooms**
Status: Abandoned
Notes/Comments: The Department does not offer courses under the purview of the Committee.
23. **Recommendation: CMD Recommendation 2016W – unstructured student study space**
Status: Completed
Notes/Comments: The Department offers study space in front of the Department Office.
24. **Recommendation: CMD Recommendation 2016X – equipment inventory**
Status: Abandoned
Notes/Comments: This is a Department-wide issue.
25. **Recommendation: CMD Recommendation 2016Y – up-to-date and working equipment**
Status: Abandoned
Notes/Comments:
26. **Recommendation: CMD Recommendation 2016Z – efficient room use in MBA**

Status: Abandoned

Notes/Comments:

27. **Recommendation:** CMD Recommendation 2016AA – dedicated classrooms

Status: Abandoned

Notes/Comments: The Department does not offer courses under the purview of the Committee.

28. **Recommendation:** CMD Recommendation 2016BB – storage space

Status: Abandoned

Notes/Comments:

29. **Recommendation:** CMD Recommendation 2016CC – software for teachers and professional development

Status: Completed

Notes/Comments: The Department provides the needed software.

30. **Recommendation:** [Click here to enter Recommendation.](#)

Status: [Click here to enter Completed, Active, On Hold, or Abandoned.](#)

Notes/Comments:

SECTION 2

Program Assessment

Program Contribution to Student Success and Equity

For the program under review, examine the following data for the last four years by:

- **Disaggregating by race/ethnicity, gender, and age where possible.**
- **Discussing internal and external factors contributing to constant, increasing or decreasing trends.**
- **Highlighting equity gaps found among different groups of students.**

- ❖ *If the program under review is a Career Education Program, please examine a) through k) from the list below.*
- ❖ *If students taking courses from the program under review end with a degree or certificate issued by the program, please examine a) through h) from the list below.*
- ❖ *If students taking courses from the program under review do not end with a degree or certificate issued by the program, please examine d) through g) from the list below.*

a) Degree Completion: Number/percent of students earning a program degree

N/A

b) Certificate Completion: Number/percent of students earning a program certificate

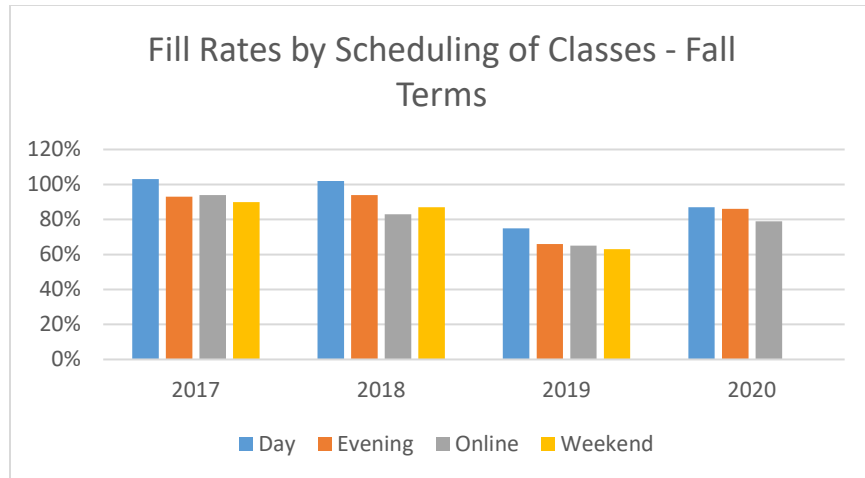
N/A

c) Transfer to a four-year institution: Number/percent of students transferring to a four-year institution

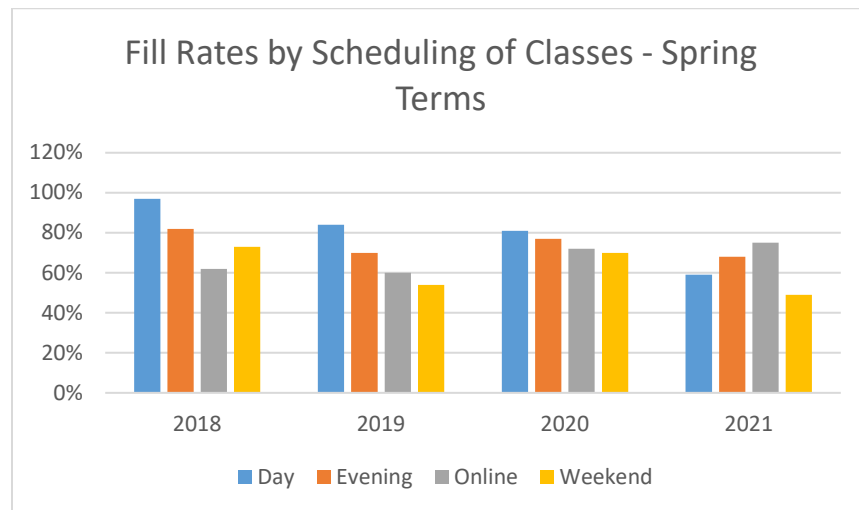
N/A

d) Scheduling of courses: Percentage of students enrolled in day/evening courses, on campus/online/hybrid courses, days of the week (Saturday and Sunday)

Fill Rate by Scheduling of Courses - Fall Terms				
Fall	Day	Evening	Online	Weekend
2017	103%	93%	94%	90%
2018	102%	94%	83%	87%
2019	75%	66%	65%	63%
2020	87%	86%	79%	0%



Fill Rate by Scheduling of Courses – Spring Terms				
Spring	Day	Evening	Online	Weekend
2018	97%	82%	62%	73%
2019	84%	70%	60%	54%
2020	81%	77%	72%	70%
2021	59%	68%	75%	49%



Fill rates for developmental math courses before the implementation of AB 705 were between 90% and 103% for the fall semesters. This includes day, evening, online, and weekend classes (held on Saturdays and Sundays). For the spring semesters, fill rates ranged between 62% and 97%, with online courses showing the lowest fill rates for developmental mathematics (between 60% and 62%).

It is important to note that evening classes, as well as weekend classes, show high fill rates. This shows the population of students we serve may be working students who were looking to take classes around their work/home schedules.

The data show fluctuations in the data, particularly in 2019. We believe two important factors resulted in significant changes:

1. Transition to AB 705.

The tables and charts above, show a large decrease in fill rates in all categories during Spring 2019 and Fall 2019. In 2019, El Camino informed students of their new mathematics placement and their right to enroll directly into transfer-level mathematics courses, if they choose to. This was to meet AB 705 compliance. As a result, the developmental courses lost popularity and the fill rates decreased as students began taking transfer level courses at a much higher rate.

After two semesters in AB 705 implementation, we noticed an increase in fill rates for all classes regardless of the scheduling days and times. One possible reason is that students attempted to take a transfer-level course and then decided to return to learn the fundamental mathematical skills that our program offered. In this occurrence, some students look to their counselors for guidance and were recommended to consider developmental mathematics if they failed their transfer-level math course (as stated above), or if have they had not taken mathematics in several years. Without loss of generality, this recommendation is not to have our students take a step back but to empower them with a choice. Given this notion, those students felt more comfortable taking a lower-placing mathematics course, even if they had the option of taking transfer-level math course.

2. Switch to remote instruction due to the pandemic.

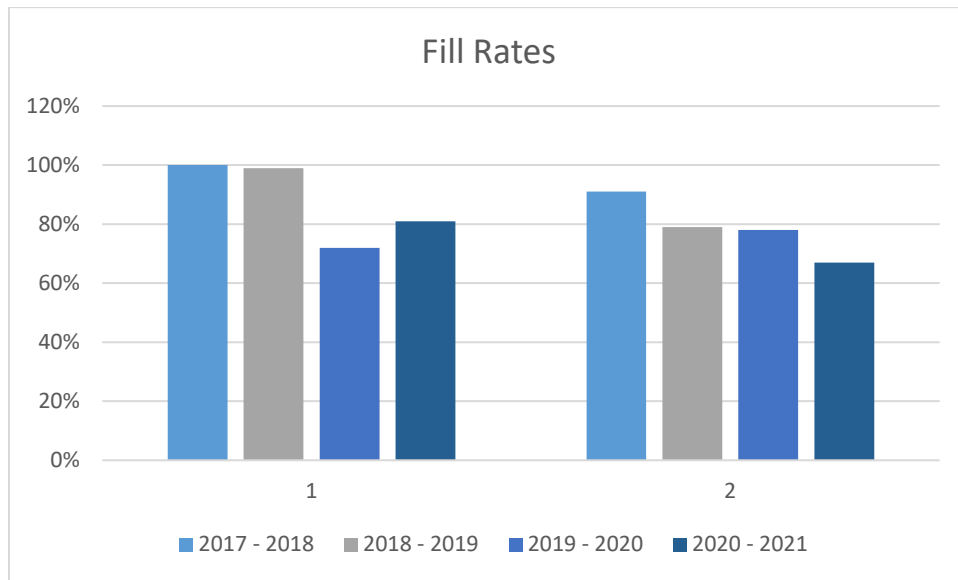
Just after completing the fourth week of the Spring 2020 semester, the transition to online instruction occurred due to the Covid-19 pandemic. The switch to remote instruction due to a closed campus where all courses shift to online modality.

Spring 2020 enrollment shows an increase in fill rates for developmental math courses. Once all classes were forced online, we note a decrease in fill rates. Moreover, there is an increase in fill rates for online classes, and the results is no weekend courses offered in Fall 2020.

Repeatedly, we continue to see fluctuation in fill rates every semester as long as developmental classes are offered alongside the implementation of AB 705.

e) Fill rate: Percentage of actual students enrolled in a term in relation to total seats offered

Fill Rate	Fall Semesters	Spring Semesters
2017 - 2018	100%	91%
2018 - 2019	99%	79%
2019 - 2020	72%	78%
2020 - 2021	81%	67%



Fill rates for developmental classes decreased since the implementation of AB 705. Which is what we expected as all students can enroll in a transfer level course. However, what we did not see is all the courses' sections empty (no students enrolled). This implies that our courses are still needed. Needed for more than just the transferring population. Committee D's courses serves other populations as well: returning adults, non-transferring who only want an AA/AS, non-transferring who only want to attain a certificate, and those that just would like to refresh/reinforce their own mathematical knowledge. We noticed the largest decrease in fill rates occurred in Spring 2019 term, when AB 705 was first implemented. The decrease in fill rates continued the following semester, however the fill rate increased again. Even if students have the option to enroll in transfer-level courses, many students decide to enroll in developmental math courses. Reasons for this may include interest in learning fundamental mathematical skills. These fundamental skills are not only useful in everyday life, but also help students through vocational classes or certificates that do not depend on transferring to a university.

f) **Grade Distribution:** Percentage of students in a course receiving each of the possible grades that can be awarded

Percentages for Grade Distribution for Fall 2017 – Fall 2021							
Math 12	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	14.57	17.1	16.8	6.72	20.09	0	0
Math 23	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	14.23	17.88	21.1	8.298	17.45	0	0
Math 37	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	0	0	0	0	0	32.17	42.85714
Math 40	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	11.07	16.77	19.8	10.62	14.65	0	0
Math 60	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	11.93	12.78	22.2	5.682	16.76	0	0
Math 67	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	12.18	22.59	22	9.43	12.18	0	0
Math 73	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	16.59	16.76	19	7.056	16.42	0	0
Math 80	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	14.05	14.9	19.7	8.657	16.94	0	0
Math 80S	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	0	0	0	0	0	42	25.33333

Percentages for Grade Distribution for Spring 2017 – Spring 2021							
Math 12	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	11.9	17.95	16.3	7.54	16.7	0	0
Math 23	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	14.9	19.2	22.1	7.77	14.9	0	0
Math 37	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	0	0	0	0	0	36.397	35.110294
Math 40	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	11.2	17.18	19.1	8.08	16.5	0	0.0859107
Math 60	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	15.3	18.21	21.4	8.18	10.3	0	0
Math 67	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	18.1	26.77	23.2	6.77	9.03	0	0
Math 73	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	18.9	16.81	19.1	6.5	9.32	0.1313	0
Math 80	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	13.2	14.61	15.5	8.34	17	0.0575	0.1726122
Math 80S	A (%)	B (%)	C (%)	D (%)	F (%)	Pass (%)	No Pass (%)
	0	0	0	0	0	52.632	22.368421

The grade distribution above shows the percentage of passing grades (A, B, or C) and not passing grades (D or F) for every course. If we assume an incoming student begins their mathematical career at Math 12, the student might deal with un-learning and relearning mathematical fundamental skills in the lower levels. As a student progresses successfully through more courses, success rates show an increase in courses like Math 40, 60, 67 and 73. Reasons for this may include students building study habits, learning to communicate with their professors, and overall gain a better understanding of college work. This may also lead to passing rates showing an increase from Fall to Spring semesters.

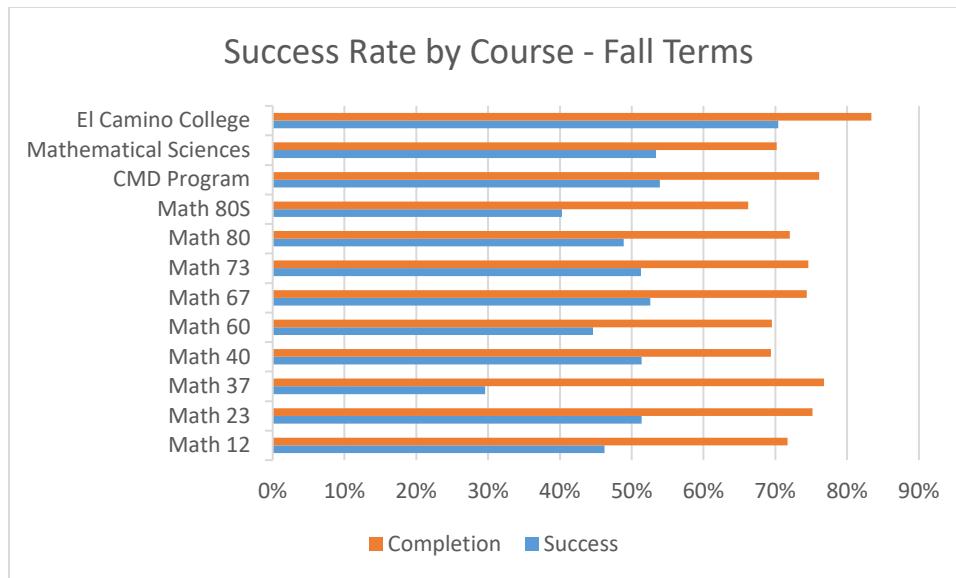
It is important to note the larger number of non-passing grades are found in Math 80 courses. This may be due to the implementation of AB 705, where many incoming students enrolled in Math 80 without enrolling into the lower courses prior to doing so.

g) Course Success: Percentage of students enrolled at census who complete the course with a grade of A, B, C, or P

Success Rates by Course

The tables below show the success rates and completion rates for the nine courses in Committee D’s program. These success rates are based on the information from the previous tables where a student is successful in the course if they earn a grade of A, B, C, or P. Although the success rates tend to be on the low end for many of our courses, the entire program success is comparable to that of the Mathematical Sciences division; however, well below the success rate for El Camino College.

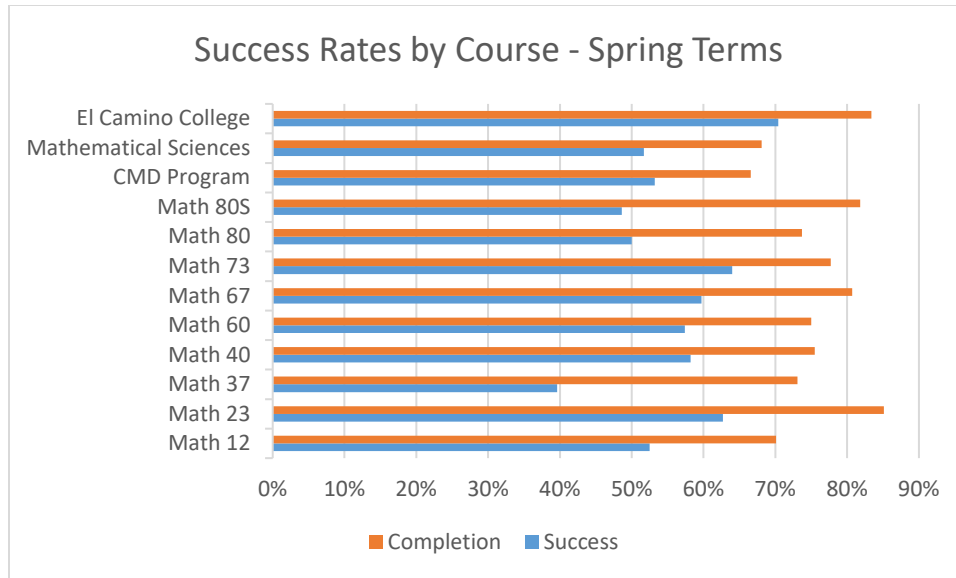
CMD – Developmental Math Program – Fall 2017 to Fall 2020		
Course	Success	Completion
Math 12	46.2%	71.7%
Math 23	51.4%	75.2%
Math 37	29.6%	76.8%
Math 40	51.4%	69.4%
Math 60	44.6%	69.5%
Math 67	52.6%	74.4%
Math 73	51.3%	74.6%
Math 80	48.9%	72.0%
Math 80S	40.3%	66.2%
CMD Program	53.9%	76.1%
Mathematical Sciences	53.4%	70.2%
El Camino College	70.4%	83.4%



It is important to note the overall success and completion rates tend to be lower during spring semesters as opposed to fall semesters. This changed slightly during Spring 2020 as it shows higher success rates during the transition to online instruction. This might be due to the flexibility students had while taking these courses during the pandemic as they can take more time to focus on the course material combined with the Emergency Withdrawals. It is also important to note that our calculations result in higher success and completion rates than those shown on the table, as it was taken from the program review website.

It is alarming to see the big discrepancy in success and completion rates of Committee D and the Mathematical Sciences division, compared to that of the entire college. Many factors can attribute to this data, and one factor is students' fear of the subject. Many students doubt their mathematical abilities. As faculty, we can promote a growth mindset toward the subject as well as help students build confidence around the subject matter.

CMD – Developmental Math Program – Spring 2018 to Spring 2021		
Course	Success	Completion
Math 12	52.5%	70.1%
Math 23	62.7%	85.1%
Math 37	39.6%	73.1%
Math 40	58.2%	75.5%
Math 60	57.4%	75.0%
Math 67	59.7%	80.7%
Math 73	64.0%	77.7%
Math 80	50.0%	73.7%
Math 80S	48.6%	81.8%
CMD Program	53.2%	66.6%
Mathematical Sciences	51.7%	68.1%
El Camino College	70.4%	83.4%



Success Rates by Gender

Success Rates – Fall 2017 to Fall 2020						
Fall Term	CMD – Developmental Math Program			El Camino College		
Year	Female	Male	Unknown	Female	Male	Unknown
2017	52.7%	49.2%	N/A	70.5%	69.2%	100.0%
2018	48.3%	46.6%	N/A	70.8%	70.1%	85.6%
2019	41.0%	39.0%	100%	68.9%	85.4%	77.9%
2020	53.9%	54.1%	N/A	68.5%	69.2%	N/A

Success Rates – Spring 2018 to Spring 2021						
Fall Term	CMD – Developmental Math Program			El Camino College		
Year	Female	Male	Unknown	Female	Male	Unknown
2018	52.1%	44.2%	N/A	71.5%	69.2%	100%
2019	45.5%	42.6%	N/A	71.8%	70.1%	81.8%
2020	76.0%	77.5%	N/A	87.0%	85.4%	86.2%
2021	56.8%	48.9%	N/A	70.2%	69.2%	69.4%

The tables above show very similar success rates for male and female students in the Committee D developmental math courses. Female students generally have a slightly higher success rate, but it shows to be minimal as it is about 3%. Two semesters (Spring 2018 and Spring 2021) showed a larger difference in success rates, where female students succeeded at 8% higher rate than male students did.

There are a couple of other noticeable differences. One is the difference in success rates of CMD by gender compared to that of the college. The difference is quite large, showing up to 20% difference, with higher success rates by gender for El Camino College.

Another important detail to mention is the unusually large increase in success rates for both male and female students during one specific semester, Spring 2020. Data continues to show a trend; students were more successful during the transition to online learning.

Success Rates by Ethnicity

Fall Semesters	2017	2018	2019	2020
African American	40.3%	40.3%	32.9%	43.3%
American Indian	42.9%	71.4%	30.8%	81.8%
Asian	67.6%	66.2%	63.1%	71.0%
Hispanic	48.8%	46.5%	41.5%	49.7%
Pacific Islander	33.3%	56.4%	28.1%	31.0%
Student Visa	75.3%	74.2%	71.7%	78.9%
Two or More Races	60.0%	57.9%	53.2%	57.5%
Unknown/Decline	45.2%	65.2%	40.1%	51.8%
White	64.8%	63.6%	59.2%	64.0%
El Camino College	53.3%	51.5%	44.7%	53.4%

Spring Semesters	2018	2019	2020	2021
African American	42.2%	36.9%	64.7%	35.3%
American Indian	40.0%	33.3%	42.9%	28.6%
Asian	70.2%	57.9%	88.4%	72.0%
Hispanic	48.4%	42.6%	78.6%	48.3%
Pacific Islander	48.3%	36.1%	87.5%	37.5%
Student Visa	74.4%	80.5%	88.4%	76.7%
Two or More Races	55.8%	50.1%	89.9%	56.6%
Unknown/Decline	22.7%	48.1%	87.1%	47.5%
White	64.1%	59.5%	86.9%	63.5%
El Camino College	53.4%	47.4%	80.7%	51.7%

In the tables above, you can see bolded success rates. Those highlighted, pertain to success rates below 50%. It is inevitable to see a large part of the table having success rates lower than 50%. Ethnic groups that continue to hold lower success rates include African American, Hispanic, American Indian and Pacific Islander groups. There are ongoing efforts on campus to collectively help close achievement gaps through equity-based practice. These efforts include required equity-based professional development for faculty. An ongoing professional development series of workshops aims to encourage dialogue around topics such

as equitable grading, capitalizing in cultural capital as well as creating an inclusive classroom environment. Special programs such as Umoja-Project Success along with the new Social Justice Center and the Black Student Success Center aim to uplift these gaps.

It is important to note, that once more, data shows the large impact of AB 705. In this case, you can see success rates for almost all ethnic groups, except that of Asian and White students, plummeted during Spring 2019 and Fall 2019.

What should be further discussed is, what did we as faculty do, during Spring 2020 that worked well for many students? Were our practices more equitable? Were we more flexible with students as we lived through a pandemic? Whatever we did during that semester was well received by our students and the success rates show it repeatedly in every category. During Spring 2020 semester, the data shows as the only semester where almost all ethnic groups had success rates over 50%, with the only exception of American Indian students with a 42.9% success rate.

Success Rates by Age

Fall Semesters	2017	2018	2019	2020
16 and Under	62.5%	100.0%	76.5%	90.5%
17 to 19	52.4%	51.2%	40.6%	50.0%
20 to 24	51.0%	50.3%	46.2%	53.5%
25 to 29	54.5%	51.4%	48.4%	56.9%
30 to 49	56.6%	56.2%	55.8%	61.7%
50+	52.2%	51.3%	56.7%	56.6%
Special Admit	85.4%	83.9%	47.8%	57.4%

Spring Semesters	2018	2019	2020	2021
16 and Under	92.3%	85.7%	86.7%	73.3%
17 to 19	52.4%	42.2%	76.4%	47.5%
20 to 24	51.9%	48.9%	81.3%	52.0%
25 to 29	58.4%	52.5%	82.2%	54.6%
30 to 49	56.9%	57.3%	88.1%	57.0%
50+	58.4%	45.6%	87.5%	55.9%
Special Admit	80.0%	67.5%	88.2%	56.2%

These tables suggest that younger students endure more difficulties when taking developmental math courses. As faculty, we need to participate in the practice of engaging younger students, perhaps by attempting a variety of instructional strategies as well as methods of assessment.

The data shows once again, that during Spring 2020, success rates were a lot higher for all age groups, but especially high for the younger students.

h) *Unit Accumulation:* Number of units accumulated by students working towards a program degree/certificate. Discuss whether students who take units beyond the requirements for their educational goals serve educational purposes or not. Focus on general trends, not on particular courses within the program.

Below is a list of multiple avenues, a student can take, for unit accumulation (assuming the student follows the sequence for developmental courses):

- i. If a student starts at Math 12, they can earn up to 17 units of developmental math before working on their transfer or degree requirements.
- ii. If a student starts at Math 23, they can earn up to 13 units of developmental math before working on their transfer or degree requirements.
- iii. If a student starts at Math 37, they can earn up to 18 units of development math before working on their transfer or degree requirements. However, the goal of this course was to give students the option to earn a minimum of 10 units.
- iv. If a student starts at Math 40, they can earn up to 9 units of developmental math before working on their transfer or degree requirements.
- v. If a student starts at Math 60, they can earn up to 9 units of development math before working on their transfer or degree requirements.
- vi. If a student starts at Math 67, they can earn up to 5 units of development math before working on their transfer or degree requirements.
- vii. If a student starts at Math 73 or 80, they can earn up to 5 units of development math before working on their transfer or degree requirements.

Thus, in either case students are getting a good opportunity to refresh/relearn, and in some cases, learn (for the first time), the very importance of the principles to problem solving. Therefore, as students are fulfilling their educational goals (achieving a certificate, AA or transferring) they are too, serving their educational purpose, which is to grow as a student and ultimately, become a better contributor to society.

i) *Annual earnings:* Median annual income of alumni who attended the program under review (or the closest related sector)

N/A

j) *Living Wage Attainment:* Percent of alumni who attended the program under review (or the closest related sector) and earn living wage

N/A

k) *Job in Field of Study:* Percent of alumni who pursued a career education path with a job related to their field of study.

N/A

Curriculum and Outcomes Assessment

a) Examine the program curriculum using an equity lens by responding to the following questions: To what extent does the curriculum:

- **Prepare students to actively engage in a diverse society?**

Before AB 705, the developmental math curriculum gave all students the mathematical foundation needed to move into a non-STEM major or STEM major. This was necessary as most of our students, high school graduates, were not entering our campus with these skills. Overly, our students are underprepared. Their mathematical knowledge, unfortunately, does not reflect their high school math grades. This is why our developmental courses are so impactful to create the bridge from high school math knowledge to transfer level math courses (Stem and Non-Stem). However, in the light on AB705, developmental math courses can be key to strengthening the needed skills of our Stem students, aside from their support courses. In addition, both avenues were connected to transferring to a university or retaining a certificate. The STEM industries and the trade professions are rapidly growing in the United States, therefore preparing our students to engage in a diverse society.

The program curriculum covered fundamentals needed in mathematics. However, it was not limited to just mathematics. In these courses students were developing the basics of mathematics, so they can move forward in their academic careers. Building strength in problem solving, gaining transferable skills and social skills is what our program helped the students develop. Overly, gaining the understanding of the basics helped set our students up for success regardless of their background in their chosen field of study. Furthermore, the Developmental courses attracted students from a wide range of disciplines and backgrounds, allowing them to interact with each other (learn social skills) in class and experience aspects of disciplines (transferable skills) that extended beyond just their major.

- **Include multicultural content?**

Committee D's courses were structured logically in that they build upon each other and the content was accessible to students coming from all backgrounds. The content historically had ties to different cultures across the globe and instructors framed the formulas and methods in terms of the cultures and regions from which they originated. Building cultural capital in the classroom enhanced student success. Many of the textbooks used in the developmental math courses contained supplemental information, in the form of short history lessons, on the originator(s) of the formula or method being covered and how it evolved into the form that we employ today. Furthermore, mathematics will continue to be a global language.

- **Respond to diverse students' learning needs?**

To begin, there are many resources available for students: Special Resources Center, Math Study Center, Supplemental Instruction (SI), and a calculator loan program for our students who are taking course from Math 40 and above. In addition, with the "safer-at-home" guidelines, the

laptop loan program was recently implemented. Lastly, each instructor has the freedom and responsibility to address other issues as they arise.

Next, some of our Math 80 sections were assigned a support course. Support courses are aimed at building up the algebra skills of the students to help them find success in this course, regardless of their learning style. The support course is flexible enough to allow an instructor to focus on what they deem is most needed for their unique class while still offering guidelines where students generally need additional instruction. This takes the form of a 2-unit course.

- **Encourage instructors and students to investigate their own views, biases and values and discuss multiple perspectives different from their own?**

The underlying skills that were developed throughout the developmental courses were the basics, specifically, learning how to problem solve. In line with problem solving was the idea that there could be multiple ways to reach a valid conclusion. However, it was more important to develop the ability to explain processes and methods, not just to focus on the final answer. These skills then translated to areas outside the classroom and allowed students to make connections that different views can exist, and some may be equally valid. In these classes, students encountered alternative approaches to solving problems and they learned essential skills to determine which method/process worked best.

For instructors, all were encouraged to be professional and open-minded. However, it is also important to maintain the same standards of excellence for all students. Teaching these classes presented the unique challenge of presenting a problem or concept and then, based on student questions or comments, having to generate an alternate approach or explanation to help aid in student comprehension. For example, when a student posed a question about a different method (for a given problem), as a class, the students and instructor explored this procedure and saw if it was valid or not; and more importantly why. This method of exploration helped students have a better understanding, and that there is not just one way of attempting a problem, regardless if it was math-related or not. Being open to new ideas, beliefs, and willing to explore them, demonstrates to students the importance of taking time to understand various methods and points of view.

- **Use critical/equity-oriented pedagogy?**

Our committee treats all students, regardless of learning style and/or backgrounds, as one race: the human race. For example, the structure of the support course for Math 80 allowed them to be accessible to students from all backgrounds. This support course focused on getting students up to speed with not only basic skills, but with the current course itself, regardless of your mathematical background. Furthermore, our Math 80 courses do not only serve a population of STEM-related majors, it also serves, a population of non-STEM majors. The curriculum was built with the sequencing of the courses in mind and therefore spent time at the start of sequence to develop and refine the students' arithmetic skills and algebra, knowing that it will pay off later.

- **Ensure creating an empowering classroom environment?**

Committee D's courses were taught in a way that allowed students the opportunity to be active participants in the learning process. This could only be done by creating a judge-free atmosphere; making our classrooms a comfortable environment to make mistakes. This permitted instructors time to spend on answering content-related questions in a thorough manner, discussing student-requested problems from the homework, allowing students to work in groups to expedite the learning process, having activities based on discovery where students formed their own conclusions through experimentation and analysis, and student projects that allow them to explore the material and its applications. Out of necessity, many of these classes were very interactive since the topics covered were best learned through practice and application, rather than rote memorization.

- **Use multiple evaluation techniques sensitive to the diverse ways students can demonstrate understanding?**

Instructors in the Developmental courses employed a variety of methods to evaluate a student's understanding of the material covered. These ranged from having students simplify standard problems, to exploring their understanding of applications through a project, to asking them to explain concepts in their own words either in written or oral form. In addition, it was not only important for students to comprehend how to simplify/solve a problem, but also understood what they were doing and why they were doing it (thus, developing practical skills and a conceptual understanding). Evaluating students in both areas is fundamental to assessing whether students have truly learned the material and have not just memorized the procedure.

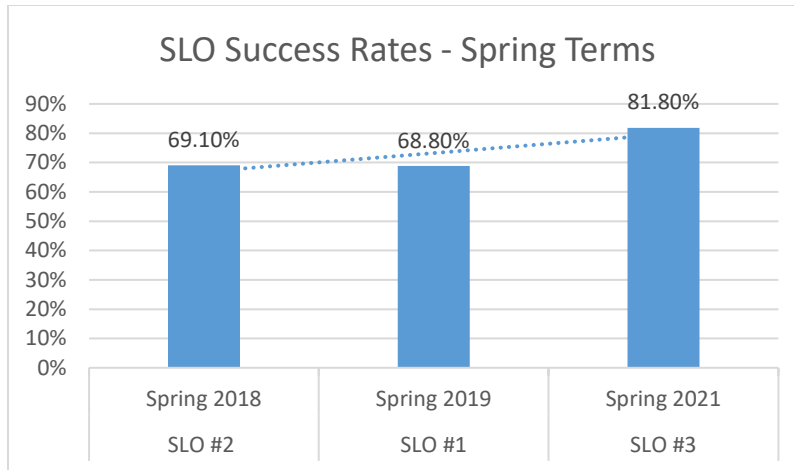
b) Summarize SLO and PLO assessment results over the past four years for key/gateway courses. Gateway courses are determined by your department & division – contact your Dean and/or campus SLO Coordinator.

Developmental Courses (in general) – SLO assessed, year assessed (semester) and results:

SLO #2 – Solving Equations and Manipulating Expressions, 2017-2018 (Spring 18) with an overall student success rate of 69.1 percent

SLO #1 – Application Problems, 2018-2019 (Spring 19) with an overall student success rate of 68.8 percent

SLO #3 – Visual and Graphical Methods, 2020-2021 (Spring 21) with an overall student success rate of 81.8 percent



Developmental Courses – SLO results by semester, per course:

Spring 18

Math 12 met the standard with a 68.8 percent student success rate
 Math 23 met the standard with a 76.3 percent student success rate
 Math 37 did not meet the standard with a 65.3 percent student success rate
 Math 40 met the standard with a 72.4 percent student success rate
 Math 60 met the standard with a 77 percent student success rate
 Math 67 met the standard with a 71 percent student success rate
 Math 73 met the standard with a 67.1 percent student success rate
 Math 80 did not meet the standard with a 55.2 percent student success rate

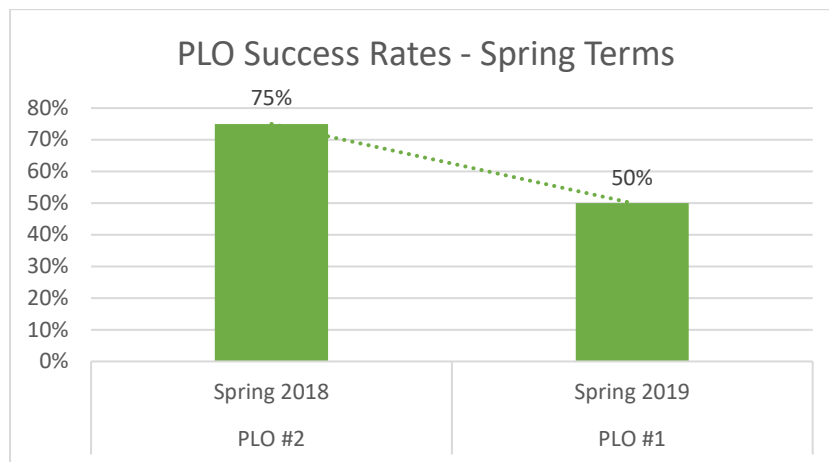
Spring 19

Math 12 met the standard with an 89 percent student success rate
 Math 23 met the standard with a 78 percent student success rate
 Math 37 did not meet the standard with a 60 percent student success rate
 Math 40 did not meet the standard with a 57 percent student success rate
 Math 60 met the standard with an 83.3 percent student success rate
 Math 67 did not meet the standard with a 53 percent student success rate
 Math 73 met the standard with a 71 percent student success rate
 Math 80 did not meet the standard with a 59 percent student success rate

Spring 21

Math 12 met the standard with a 77 percent student success rate
 Math 23 met the standard with an 81.8 percent student success rate
 Math 40 met the standard with a 91 percent student success rate
 Math 60 met the standard with a 78.1 percent student success rate
 Math 67 did meet the standard with a 100 percent student success rate as about only 38% of the students in the course were assessed
 Math 73 met the standard with an 89 percent student success rate
 Math 80 met the standard with a 55.4 percent student success rate

Developmental Courses – PLO (number) assessed, year assessed (semester) and results:
PLO #2, 2017-2018 (Spring 18) with a success rate of 75 percent
PLO #1, 2018-2019 (Spring 19) with a success rate of 50 percent



In addition, there are no gateway courses within our Developmental Courses.

- c) **Discuss programmatic factors contributing to constant, increasing or decreasing trends in the results for SLO and PLO assessment within the previously examined courses.**

SLO

From Spring 2018 to Spring 2019, SLOs had a drop of .3 percent. We believe this was contributed to the methods of delivering the SLO assessment. Where most methods were to incorporate the SLO assessment question(s) into a course assessment (quiz or exam). Also, some instructors like to have the SLO assessment as an individual assessment. Nevertheless, the SLO question(s) has and must be a part of a graded assessment or its own graded assessment. In addition, modeling problems, using worksheets, involving students to engage into peer-to-peer discussions are some of the contributing factors to the consistency in the results.

From Spring 2019 to Spring 2021, SLO increased by 13 percent. We believe, a contributing factor is the different skills, different SLO question assess. In Spring 19, the skill being assessed was applications of problems. In Spring 21, the skill being assessed was methods for visualizing and graphical readings. Furthermore, visualizing has much less layers of understanding than application problems, which can involve graphical skills. If you look at the success of the individual courses, you will find that in Spring 21 there was only one course with an unmet standard, whereas in Spring 19, there were 4. Another factor the increase can be contributed to is, the programmatic factors mentioned above coupled with the COVID-19 pandemic. The pandemic forced instructors to transition to remote instruction. This situation does not allow us to assess students in a classroom setting; therefore, creating the opportunity (for our students) to use other resources when assessing for the SLO. Nonetheless, we still believe the increase would have occur, but not as high, because students were assessed online (not in the classroom).

PLO

From Spring 2018 to Spring 2019 PLO rates decreased by 25 percent. This substantial decrease could be tied to the decrease in SLO success rates, as the PLO is a review of the aligned SLO data. Aside from the actual student success rates for those semesters (given above), the Spring 18 semester experienced two courses whose SLO standards were not met. Whereas in Spring 19, there were five courses whose standards were not met. Hence, the decline in success rate for PLO. Furthermore, we believe that the decline can also be attributed to the change in SLO question from manipulating expressions to solving applications. Manipulating expressions is covered more in the beginning of the course and applications are covered closer to the end of the course; implying, that you need to know how to manipulate an expression in order to do most applications problems involving solving equations. Nonetheless, we expect an increase in the following PLO.

Furthermore, SLO and PLO results highlight what we are doing as instructors and how we can better serve our students. The more data we compile, the more evidence we have to implement what is needed for the population of students this committee serves. Overly, we cannot wait to assess in the classroom.

d) Highlight equity gaps found in SLO and PLO assessment results among different groups of students.

Unfortunately, we do not have this information at this time. However, as we transition to uploading our SLO results on Canvas, which will carry the students' ID number, the ID number will allow us to categorize our students into different groups revealing equity gaps (if there is any).

SECTION 3

Program Vision and Future Planning

Program Vision

A) Describe the vision of the program for the next four years considering the assessment reported in the previous section, student groups that are underrepresented in the program's field, and any relevant changes within the program field/industry. A vision statement describes the desired future state of the program.

With the exception of the non-credit math academy courses (Math 17A, 27A, and 47A), the mathematical sciences division will no longer be offering credit-bearing developmental math courses in the foreseeable future. This is the result of compliance with AB 705. The program, therefore, will continue to support our students by monitoring the success rates and finding ways to improve them. We will also seek to build partnerships with the other committees in the mathematics department to look for ways to support their success rates and improve learning.

The program continues to believe that at least some sections of Math 80 (Intermediate Algebra) should be offered every semester despite AB 705 and the Chancellor's Office requests to discontinue all credit-bearing developmental course. In addition, maybe even creating a credited Algebra course that can support STEM majors and can be a gateway to other majors as a prerequisite. There are other majors that enjoy the idea of their students strengthening their algebra skills before entering their course. Furthermore, we may consider a non-credit version of this algebra course.

Future Planning

A) Based on the assessment reported in the previous section, develop program goals to be completed during the next four years in relation to:

- **Adjusting the curriculum for coherence and alignment with students' workforce needs**
- **Advancing towards a more equitable program to close equity gaps among groups of students**
- **Clarifying students' paths to completion, further education and employment**
- **Helping students explore options and build foundation skills**
- **Helping students stay on the path**
- **Integrating applied learning experiences**

Given that no credit-bearing courses under the purview of the program will be offered due to AB 705, Committee D will look for other ways to make meaningful differences in students' success. One possibility is to look at non-credit courses to prepare students for transfer-level classes.

B) What projects will the program complete to achieve the desired goals? Please specify at least two for each goal.

The program will track success rates in transfer-level courses and attempt to identify places where the program could make an impact. The program will seek to collaborate with the other committees in the Department including holding joint meetings to plan ways to support their transfer-level math courses. Specifically, we want to study the viability of using non-credit courses to prepare students for transfer-level courses, tailored for different educational goals. We could have a course for STEM students, one for statistics students, one for students seeking an AA only, and others. Our math academy courses (17A, 27A, 47A) were not designed for this task and we want to examine if they can be redesigned for this task.

Some challenges in creating these courses include determining who is going to teach these courses, full time vs adjuncts, how the instructors are going to be compensated (non-credit courses are compensated at a lower rate than credit-bearing courses), what material is going to be included, and determining an evaluation procedure to confirm that these classes are genuinely improving success rates of transfer-level courses.

C) When the next program review is due, how will the program determine if the goals have been met? Please specify at least one quantitative target or qualitative accomplishment for each goal.

Confirm that we have studied the viability of non-credit courses to prepare students for transfer-level math courses. If these courses are found to be viable, confirm that we have begun the process of creating and implementing them.

Confirm that we have collaborated with the other committees and have implemented the recommendations that we came up with.

Program Resources

In the following areas, what are the resources needed by the program to meet the goals for the next four years?

- **List resources in order of priority. You might want to prioritize them within each category and/or develop an overall prioritized list of resources.**

We have no resources requisitions at this time.

- **Explain how these resources contribute to the [College's equity goals](#).**

a) Staffing

We have no resources requisitions at this time.

b) Facilities and Equipment

We have no resources requisitions at this time.

c) Technology/Software

We have no resources requisitions at this time.

d) Contracts/Services

We have no resources requisitions at this time.

APPENDIX A

CAREER EDUCATION (CE) SUPPLEMENTAL QUESTIONS

CE programs must conduct a full program review every 4 years. The comprehensive program review includes responses to the CE supplemental questions below. Every two years (once between full program reviews) these supplemental questions must be answered and submitted to Academic Affairs for posting on the College website.

Use labor market data, advisory committee input/feedback, and institutional and program-level data to respond to the following questions:

- 1. How strong is the occupational demand for the program?** In your response, describe any changes in demand over the past 5 years and discuss the occupational outlook for next five (5) years. Provide applicable labor market data (e.g., US Bureau of Labor Statistics, Employment Development Department) that address state and local needs.

N/A

- 2. How does the program address needs that are not met by similar programs in the region?** In your response, identify any distinctive components of the program (e.g., curriculum, facilities, resources) and/or describe any unique contributions the program or its students/graduates make to the community served.

N/A

- 3. What are the completion, success, and employment rates for students in the program?** In your response, identify the standards set by the program and discuss any factors that may impact completion, success, and employment rates among students in the program. Describe the status of any action plans for maintaining/improving rates relative to such benchmarks.

N/A

- 4. List any licensure/certification exam(s) required for entry into the workforce in the field of study and report the most recent pass rate(s) among program graduates.** In your response, identify any applicable performance benchmarks set by regulatory agencies and describe the status of any action plans for maintaining/improving pass rates relative to such benchmarks.

N/A

- 5. Are the students satisfied with their preparation for employment? Are the employers in the field satisfied with the level of preparation of program graduates?** Use data from student surveys, employer surveys, and other sources of employment feedback to justify your response.

N/A

6. **Is the advisory committee satisfied with the level of preparation of program graduates? How has advisory committee input and feedback been used in the past two years to ensure employer needs are met by the program?** Describe the status and impact of any advisory committee recommendations.

N/A

California Education Code 78016 requires that the review process for CE programs includes the review and comments of a program's advisory committee. **Provide the following information:**

- a. Advisory committee membership list and credentials.
- b. Meeting minutes or other documentation to demonstrate that the CE program review process has met the above Education Code requirement.