2020-21
Annual Program Review

Mathematics

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Section 1: Program Planning

Internal Analysis and Program Effectiveness: Mathematics

Productivity	2014-15	2015-16	2016-17	2017-18	2018-19
State-Funded Enrollment	61,279	63,824	60,164	61,368	59,444
Subject State-Funded Enrollment	5,004	5,583	5,657	5,924	5,937
State-Funded Resident FTES	6,073.30	6,343.88	5,929.28	6,189.33	6,104.88
Subject Resident FTES	597.35	666.14	685.13	731.95	750.77
Sections	130	160	160	175	181
Fill Rate	78.1%	72.7%	75.3%	75.7%	75.3%
WSCH/FTEF 595 Efficiency	568	512	515	513	489
FTEF/30	17.5	21.9	22.5	23.9	25.8
Extended Learning Enrollment	1,099	1,118	985	799	968

The percentage change in the number of Mathematics **enrollments** in 2018-19 showed a minimal difference from 2017-18 and a substantial increase from 2014-15.

The percentage change in 2018-19 **resident FTES** in Mathematics credit courses showed a slight increase from 2017-18 and a substantial increase in comparison with resident FTES in 2014-15.

The percentage change in the number of **sections** in Mathematics courses in 2018-19 showed a slight increase from 2017-18 and a substantial increase from the number of sections in 2014-15.

The percentage change in the **fill rate** in 2018-19 for Mathematics courses showed a minimal difference from 2017-18 and a slight decrease in comparison with the fill rate in 2014-15.

The percentage change in the **WSCH/FTEF** ratio in Mathematics courses in 2018-19 showed a slight decrease from 2017-18 and a substantial decrease from 2014-15.

The percentage change in the **FTEF/30** ratio for Mathematics courses in 2018-19 showed a moderate increase from 2017-18 and a substantial increase in comparison with the FTEF/30 ratio in 2014-15.

There was a substantial increase in the number of Mathematics **Extended Learning enrollments** in 2018-19 from 2017-18 and a substantial decrease from 2014-15.

Calculation Categories

Language	Range
Minimal to No Difference	< 1.0%
Slight Increase/Decrease	Between 1.0% and 5.0%
Moderate Increase/Decrease	Between 5.1% and 10.0%
Substantial Increase/Decrease	> 10.0%

Comparison of Enrollment Trends	2014-15	2015-16	2016-17	2017-18	2018-19
State-Funded Enrollment	61,279	63,824	60,164	61,368	59,444
Subject State-Funded Enrollment	5,004	5,583	5,657	5,924	5,937

Modality	2014-15	2015-16	2016-17	2017-18	2018-19
Traditional	10.8%	11.2%	8.9%	7.6%	7.2%
Online	77.0%	72.8%	71.3%	72.5%	75.9%
Hybrid	0.0%	1.2%	1.4%	1.5%	1.0%
Correspondence (Cable, Telecourse, Other DL)	12.2%	14.8%	18.4%	18.4%	15.8%

Gender	2014-15	2015-16	2016-17	2017-18	2018-19
Female	54.8%	51.0%	49.5%	48.4%	50.1%
Male	43.6%	47.4%	48.8%	49.7%	48.3%
Unknown	1.6%	1.6%	1.6%	1.9%	1.7%

Ethnicity	2014-15	2015-16	2016-17	2017-18	2018-19
African American	5.7%	6.2%	6.6%	6.5%	5.9%
American Indian/AK Native	0.3%	0.5%	0.5%	0.5%	0.4%
Asian	27.9%	24.0%	22.3%	22.0%	22.2%
Hispanic	14.4%	16.6%	16.3%	18.5%	17.4%
Pacific Islander/HI Native	0.3%	0.2%	0.4%	0.3%	0.3%
White	35.6%	35.4%	36.0%	34.6%	33.5%
Multi-Ethnicity	14.6%	15.6%	16.8%	16.6%	18.3%
Other/Unknown	1.4%	1.5%	1.2%	1.0%	1.9%

Age Group	2014-15	2015-16	2016-17	2017-18	2018-19
19 or Less	11.8%	13.5%	13.4%	14.0%	16.1%
20 to 24	31.3%	28.8%	29.3%	29.6%	30.3%
25 to 29	18.6%	18.1%	17.4%	17.8%	17.1%
30 to 34	11.6%	12.2%	10.7%	11.3%	11.0%
35 to 39	7.0%	7.8%	8.3%	8.5%	8.2%
40 to 49	10.5%	10.2%	12.0%	10.6%	9.8%
50 and Older	9.3%	9.3%	8.9%	8.1%	7.6%
Unknown	0.0%	0.0%	0.0%	0.0%	0.0%

Mathematics courses made up 10.0% of all state-funded enrollment for 2018-19. The percentage difference in Mathematics course **enrollment** in 2018-19 showed a minimal difference from 2017-18 and a substantial increase from 2014-15. Enrollment in Mathematics during 2018-19 showed 7.2% of courses were taught **traditional (face-to-face**), 75.9% were taught **online**, 1.0% were taught in the **hybrid** modality, and 15.8% were taught in the **correspondence (cable, telecourse, and other distance learning)** modality.

In 2018-19, Mathematics enrollment consisted of 50.1% **female**, 48.3% **male**, and 1.7% students of **unknown** gender. In 2018-19, Mathematics enrollment consisted of 5.9% **African American** students, 0.4% **American Indian/AK Native** students, 22.2% **Asian** students, 17.4% **Hispanic** students, 0.3% **Pacific Islander/HI Native** students, 33.5% **White** students, 18.3% **multi-ethnic** students, and 1.9% students of **other** or **unknown** ethnicity. The age breakdown for 2018-19 enrollments in Mathematics revealed 16.1%

aged **19 or less**, 30.3% aged **20 to 24**, 17.1% aged **25 to 29**, 11.0% aged **30 to 34**, 8.2% aged **35 to 39**, 9.8% aged **40 to 49**, 7.6% aged **50 and older**, and 0.0% **unknown**.

Success and Retention: Mathematics

Comparison of Success Rates	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**
State-Funded Success Rate	65.4%	66.7%	68.6%	70.9%	72.2%
College Institution Set Standard Success Rate	55.4%	55.5%	56.7%	58.3%	59.8%
Subject Success Rate	59.1%	59.0%	58.1%	58.2%	58.4%

Modality	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**
Traditional	68.9%	62.4%	64.0%	67.7%	66.7%
Online	57.6%	57.4%	56.9%	54.8%	55.3%
Hybrid	-	58.0%	55.6%	69.3%	80.6%
Correspondence (Cable, Telecourse, Other DL)	59.5%	64.2%	60.4%	66.4%	68.1%

Gender	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**
Female	59.3%	57.6%	56.7%	56.4%	56.8%
Male	58.9%	60.5%	59.6%	60.1%	59.7%
Unknown	57.3%	62.2%	58.7%	50.9%	69.7%

Ethnicity	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**
African American	46.0%	44.7%	40.1%	41.9%	46.3%
American Indian/AK Native	46.2%	55.6%	50.0%	46.9%	60.0%
Asian	70.7%	69.9%	69.2%	67.8%	69.2%
Hispanic	49.0%	50.5%	51.6%	53.8%	50.1%
Pacific Islander/HI Native	20.0%	38.5%	56.5%	35.3%	40.0%
White	59.4%	60.6%	62.7%	60.2%	61.9%
Multi-Ethnicity	52.6%	52.8%	47.2%	53.1%	51.0%
Other/Unknown	52.9%	67.5%	61.2%	60.3%	59.3%

Age Group	**2014-15**	**2015-16**	**2016-17**	**2018-19**	**2018-19**
19 or Less	61.8%	62.6%	57.8%	59.6%	60.2%
20 to 24	57.3%	54.2%	57.7%	54.6%	54.4%
25 to 29	57.2%	58.0%	56.5%	56.6%	57.6%
30 to 34	58.6%	59.2%	58.2%	58.5%	59.4%
35 to 39	56.9%	61.7%	56.7%	58.6%	61.6%
40 to 49	59.1%	60.9%	59.6%	62.5%	60.5%
50 and Older	67.8%	65.9%	62.6%	65.6%	64.7%
Unknown	-	-	-	-	-

The percentage difference in the **course success rate** in Mathematics courses in 2018-19 showed a minimal difference from 2017-18 and a slight decrease from 2014-15. When comparing the percentage point difference in the Mathematics 2018-19 course success rate to the College's overall success average* (72.2%) and the institution-set standard* (59.8%) for credit course success, the Mathematics **course**

success rate was substantially lower than the **college average** and slightly lower than the **institution-set standard** for credit course success.

When comparing the percentage point difference between instructional modalities to the overall Mathematics success rate for 2018-19, the success rate was a moderate increase for **traditional (face-to-face)** Mathematics courses, a slight decrease for **online** courses, a substantial increase for **hybrid courses**, and a moderate increase for **correspondence (cable, telecourse, and other distance learning)** courses.

When comparing the percentage point difference between genders to the overall Mathematics success rate for 2018-19, the success rate was a slight decrease for **female** students in Mathematics courses, a slight increase for **male** students, and a substantial increase for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Mathematics success rate for 2018-19, the success rate was a substantial decrease for **African American** students in Mathematics courses, a slight increase for **American Indian/AK Native** students, a substantial increase for **Asian** students, a moderate decrease for **Hispanic** students, a substantial decrease for **Pacific Islander/HI Native** students, a slight increase for **White** students, a moderate decrease for **multi-ethnic** students, and a minimal difference for students of **other** or **unknown** ethnicity.

When comparing the percentage point difference between age groups to the overall Mathematics success rate for 2018-19, the success rate was a slight increase for students aged **19 or less** in Mathematics courses, a slight decrease for students aged **20 to 24**, a minimal difference for students aged **25 to 29**, a slight increase for students aged **30 to 34**, a slight increase for students aged **35 to 39**, a slight increase for students aged **40 to 49**, a moderate increase for students aged **50 and older**, and no comparative data for students of unknown age.

Comparison of Retention Rates	2014-15	2015-16	2016-17	2017-18	2018-19
State-Funded Retention Rate	82.3%	83.4%	83.7%	85.1%	86.1%
College Institution Set Standard Retention Rate	70.1%	70.0%	70.9%	71.1%	72.3%
Subject Retention Rate	78.1%	76.9%	76.5%	77.4%	76.4%

Modality	2014-15	2015-16	2016-17	2017-18	2018-19
Traditional	88.4%	84.0%	80.9%	85.8%	82.1%
Online	76.3%	75.3%	76.0%	75.2%	74.0%
Hybrid	-	75.4%	75.3%	83.0%	90.3%
Correspondence (Cable, Telecourse, Other DL)	79.8%	79.2%	76.3%	82.4%	84.5%

Gender	2014-15	2015-16	2016-17	2017-18	2018-19
Female	78.4%	76.6%	76.9%	76.7%	75.4%
Male	77.5%	77.0%	75.8%	78.3%	77.3%
Unknown	81.7%	81.1%	83.7%	74.1%	80.8%

Ethnicity	2014-15	2015-16	2016-17	2017-18	2018-19
African American	71.9%	73.5%	65.1%	70.5%	74.4%
American Indian/AK Native	69.2%	74.1%	80.8%	84.4%	84.0%
Asian	84.4%	81.5%	82.6%	82.6%	82.7%
Hispanic	73.3%	74.2%	71.7%	77.1%	71.9%
Pacific Islander/HI Native	66.7%	69.2%	69.6%	70.6%	75.0%
White	78.3%	77.5%	79.1%	77.4%	77.1%
Multi-Ethnicity	73.5%	72.5%	72.0%	73.3%	72.6%
Other/Unknown	68.6%	78.3%	77.6%	82.8%	73.5%

Age Group	2014-15	2015-16	2016-17	2017-18	2018-19
19 or Less	80.9%	82.9%	80.9%	81.8%	78.5%
20 to 24	78.8%	74.9%	78.6%	76.7%	76.0%
25 to 29	75.9%	75.3%	74.6%	75.0%	74.2%
30 to 34	77.3%	76.8%	75.1%	76.5%	75.8%
35 to 39	74.7%	75.9%	70.4%	73.5%	77.1%
40 to 49	74.6%	76.1%	74.8%	79.6%	74.8%
50 and Older	83.7%	78.9%	76.3%	80.4%	80.7%
Unknown	-	-	-	-	-

The percentage difference in the **course retention rate** in Mathematics courses in 2018-19 showed a slight decrease from 2017-18 and a slight decrease from 2014-15. When comparing the percentage point difference in the Mathematics 2018-19 course retention rate to the College's overall retention average* (86.1%) and the institution-set standard* (72.3%) for credit course retention, the Mathematics **course retention rate** was moderately lower than the **college average** and slightly **higher** than the **institution-set standard** for credit course retention.

When comparing the percentage point difference between instructional modalities to the overall Mathematics retention rate for 2018-19, the retention rate was a moderate increase for **traditional (face-to-face)** Mathematics courses, a slight decrease for **online** courses, a substantial increase for **hybrid**

courses, and a moderate increase for **correspondence (cable, telecourse, and other distance learning)** courses. The retention rate is above 74% for all the modalities.

When comparing the percentage point difference between genders to the overall Mathematics retention rate for 2018-19, the retention rate was a minimal difference for **female** students in Mathematics courses, a minimal difference for **male** students, and a slight increase for students of **unknown** gender. The retention rate is above 75% for all the genders.

When comparing the percentage point difference between ethnicity groups to the overall Mathematics retention rate for 2018-19, a moderate increase for **American Indian/AK Native and Asian** students. However, the percentages of all different ethnicity show all 72 or above 72%.

When comparing the percentage point difference between age groups to the overall Mathematics retention rate for 2018-19, a slight increase for students aged **35 to 39**, a slight increase for students aged **50 and older**. All the aged groups show the retention rate above 74%.

Equity

Based on the data trends above, majority of student prefer taking math courses online, but we do offer all the modalities, traditional, online, hybrid, and correspondence (cable) in order to accommodate all the students with different needs.

In 2018-19, Mathematics enrollment consisted of 50.1% **female**, 48.3% **male**, between two genders, the differnence shows only 1.8%. In 2018-19, Mathematics enrollment in term of ethnicity, the highest percent is white students, the lowest percent is Pacific Islander/HI Native students with 0.3%, also American Indian/AK Native has the low percent as 0.4%. Both percent rates showed gaps among all ethnicities, especially, comparing with with White and Asian, there are substiantial difference.

When comparing the percentage point difference between genders to the overall Mathematics retention rate for 2018-19, the retention rate was a minimal difference for **female** students in Mathematics courses, a minimal difference for **male** students, and a slight increase for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Mathematics retention rate for 2018-19, the retention rate was a slight decrease for **African American** students in Mathematics courses, a moderate increase for **American Indian/AK Native** students, a moderate increase for **Asian** students, a slight decrease for **Hispanic** students, a slight decrease for **Pacific Islander/HI Native** students, a minimal difference for **White** students, a slight decrease for **multi-ethnic** students, and a slight decrease for students of **other** or **unknown** ethnicity.

Mathematics retention rate for 2018-19, the retention rate was a slight increase for students aged **19 or less** and the group aged 50 and older. The other aged groups show a minimal difference

Achievement

When comparing the percentage point difference between instructional modalities to the overall Mathematics **success** rate for 2018-19, the success rate was a moderate increase for **traditional (face-to-face)** Mathematics courses, a substantial increase for **hybrid courses**, and a moderate increase for **correspondence** courses.

When comparing the percentage point difference between genders to the overall Mathematics **success** rate for 2018-19, a slight increase for **male** students, and a substantial increase for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Mathematics **success** rate for 2018-19, the success rate was a slight increase for **American Indian/AK Native** students, a substantial increase for **Asian** students, and a slight increase for **White** students.

When comparing the percentage point difference between age groups to the overall Mathematics **success** rate for 2018-19, the success rate was a slight increase for students aged **19 or less** in Mathematics courses, a slight increase for students aged **30 to 34**, a slight increase for students aged **35 to 39**, a slight increase for students aged **40 to 49**, a moderate increase for students aged **50 and older**.

When comparing the percentage point difference between age groups to the overall Mathematics **retention** rate for 2018-19, the retention rate was a slight increase for students aged **19 or less** in

Mathematics courses, a minimal difference for students aged **20 to 24**, a slight decrease for students aged **25 to 29**, a minimal difference for students aged **30 to 34**, a slight increase for students aged **50 and older**.

When comparing the percentage point difference between instructional modalities to the overall Mathematics retention rate for 2018-19, the retention rate was a moderate increase for **traditional (face-to-face)** Mathematics courses, a substantial increase for **hybrid courses**, and a moderate increase for **correspondence)** courses.

When comparing the percentage point difference between genders to the overall Mathematics retention rate for 2018-19, the retention rate was a minimal difference for **female** students in Mathematics courses, a minimal difference for **male** students, and a slight increase for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Mathematics retention rate for 2018-19, a moderate increase for **American Indian/AK Native and Asian** students. However, the percentages of all different ethnicity show all above 70%.

When comparing the percentage point difference between age groups to the overall Mathematics retention rate for 2018-19, a slight increase for students aged **35 to 39**, a slight increase for students aged **50 and older**.

Program Efficiency

The percentage change in the number of Mathematics **enrollments** in 2018-19 showed a minimal difference from 2017-18 due to section-cut for college efficiency schedule. However, the data showed a substantial increase the percentage from 2014-15. The percentage change in 2018-19 **resident FTES** in Mathematics credit courses showed a slight increase from 2017-18 and a substantial increase in comparison with resident FTES in 2014-15. The percentage change in the number of **sections** in Mathematics courses in 2018-19 showed a slight increase from 2017-18 and a substantial increase from the number of sections in 2014-15.

The percentage change in the **fill rate** in 2018-19 for Mathematics courses showed a minimal difference from 2017-18. The rate is still high as 75.3%. The percentage change in the **WSCH/FTEF** ratio in Mathematics courses in 2018-19 showed a slight decrease from 2017-18 and a substantial decrease from 2014-15. The percentage change in the **FTEF/30** ratio for Mathematics courses in 2018-19 showed a moderate increase from 2017-18 and a substantial increase in comparison with the FTEF/30 ratio in 2014-15. There was a substantial increase in the number of Mathematics **Extended Learning enrollments** in 2018-19 from 2017-18. Based on the data above, hiring a full-time faculty is needed to increase the Program Efficiency.

Calculation Categories

Language	Range
Minimal to No Difference	< 1.0%
Slight Increase/Decrease	Between 1.0% and 5.0%
Moderate Increase/Decrease	Between 5.1% and 10.0%
Substantial Increase/Decrease	> 10.0%

Student (SLOs) and Program Student Learning Outcomes (PSLOs)

SLO Assessment and Plan (Fall)

Course	SLO	Method(s) of Assessment	Participant(s) in the Planning Discussion	Recommended Changes
Math C005	Upon completion of the course students will be able to: Perform basic mathematical operations and apply it to consumer applications.	Midterm Exam, Final Exam, and final course grade	Junko Forbes	1. There was a huge improvement in the outcomes. Implementation of the last recommendation: "Create discussion board questions that require students to explain their work instead of simply asking them to solve problems" helped students' understanding of the material since they were required to explain their thinking process. 2. A Consistent support system through weekly feedback on each student's progress, feedback on assignments/exam results to increase retention rates and students' chance of successfully completing the course. 3. Survey students midway through the semester, to capture perceptions of their learning and the educational environment (the class, the instructor, the college) that supports it.
Math 008	Upon completion of the course students will be able to: Evaluate algebraic expressions involving the real number system and solve simple algebraic equations.	Final Exam; final course grade	Jessica Kuang	1.This course will no longer be offered due to AB705, so the following recommendation is for cable course in general. 2. Change the modality of this course to online (limited edition for incarcerate students), so students could interact with the instructors easily – I do believe that this will happen in two years.

Math 045	1. Set up a linear equation or inequality; then find the solution and explain the answer of an application problem. 2. Solve quadratic, polynomial, rational, radical, exponential, and logarithmic equations. Use technology appropriately (e.g., calculators, software, etc.) to enhance mathematical thinking, visualization, and understanding, to solve mathematical problems, and to judge the reasonableness of the results. 3. Apply the concept of a function; solve and graph quadratic, rational, radical, exponential, and logarithmic functions at a collegiate level.	Final Exam and Final Course Grade	Son Nguyen Thomas Cao Lisa Lee Duy Tran	1.Encourage students to be more comfortable utilizing the student success center. 2.Ensure students are utilizing the student success center and ensure that they are receiving the help they need to succeed. 3.Research pedagogy, techniques, and support systems that might help students in accelerated classes increase their chance of successfully completing the course. 4.Integrate RSIs for specific topics and content most frequently missed which lower their scores on assessments. 5.Discuss with math department for different methods of assessment to increase SLOs and the impact of AB 705. 6.Share outcomes and recommendations with other faculty to solicit feedback and finalize recommendations. 7. Add a media assignment including short videos and assessment questions to provide consistent support 8. Add a discussion board assignment next semester on Rational and Logarithmic problems to reinforce related concepts. 9. Address common conceptual mistakes as one of Discussions assignments next semester. 10. Have an embedded tutor to help students for MyMathLab assignments. Provide individual weekly video feedback on Canvas's Speedgrader for weekly discussion prompt. Provide tips for math test taking

				strategies to help students reducing anxieties when taking tests.
Course	**SLO**	**Method(s) of Assessment**	**Participant(s) in the Planning Discussion**	**Recommended Changes**
Math 160	Collect, analyze, and summarize sample data; write inferences; make predictions; and solve problems involving analysis of variance.	Midterm Exam and Final Exam	Mutsuno Ryan John Ryan Lisa Lee Christa Solheid	1.I would like to introduce more real-life examples that are relevant to today's social issues that involve studies that have statistical conclusions. 2. will include more topical discussions that are statistically based so that the students continue include themselves in the analysis. 3.I would like to collaborate more with other faculty for ideas that make statistical analysis more relevant in today's world. 4. Have an embedded tutor to help students for MyMathLab assignments. Create supplemental videos on how to use graphing calculator for statistics tools. 5.Have weekly group discussions in class to help students to get a chance to discuss and present their work on the board. Provide algebra background review worksheets to help students reviewing basics important skills for their statistics. 6. Collect midterm survey from students to receive their feedback and provide appropriate helps if needed.

				7. Require Hands-on Activity Projects by collecting the real data. 8. Offer more In-Class Activity related to real-life applications. 9. Use a technology to solve the problem, such as TI-84 Plus or Statistical software. 10. I would like to have students submit more written assessments throughout the course to increase the amount of feedback they receive. 11. I would like to collaborate with other faculty to learn what methods they are trying to improve success. 12. I would like to find a way to help students better prepare for critical assessments. Study skills techniques.
Course	**SLO**	**Method(s) of Assessment**	**Participant(s) in the Planning Discussion**	**Recommended Changes**
Math 185	Solve first-order differential equations; apply higher-level integration skills; and determine the convergence or divergence of sequences, series, and power series.	Midterm Exam, Final Exam, and final course grade	Chau Duc Tran	1. Help student with a deeper review of Calculus I, Algebra, and Trigonometry. 2. Collaborate with other faculty for ideas that make teaching Calculus more relevant in today's world.

SLO Assessment and Plan (Spring 2019)

Course	SLO	Method(s) of Assessment	Participant(s) in the Planning Discussion	Recommended Changes
Math C030	1. Set a linear equation or inequality; then find the solution and explain the answer of an application problems. 2. Solve quadratic, polynomial, rational, radical, exponential, and logarithmic equations. 3. Use technology appropriately (e.g., calculators, software, etc.) to enhance mathematical thinking, visualization, and understanding, to solve mathematical problems, and to judge the reasonableness of the results. 4. Apply the concept of a function; solve and graph quadratic, rational, radical, exponential, and logarithmic functions at a collegiate level.	Midterm Exam, Final Exam, and final course grade	Junko Forbes Thomas Cao Kazumi Horikawa	1. A consistent support system via letters on student's progress, feedback on assignments/exam results to increase retention rates and students' chance of successfully completing the course. 2. Answering students' questions via e-mail and/or letters. 3. Improve the course handbook. 4. Share outcomes and recommendations with other faculty to solicit feedback and finalize recommendations. 5. Continue to use the discussion board assignment seemed to reinforce the concept. 6. The new media assignment along with a follow-up discussion with the students has shown significant improvement in this area. 7. The discussion board assignment addressing common conceptual errors really helps. 8. I submitted the information in the Starfish; that one student was behind assignment and the other student was having difficulties in the class. I did not know how they communicated with students, but both dropped from the classes. Especially Starfish contacted one student many times by e-mails, text messages, and phones, even after the student withdrew from the class. I asked several times not to keep contacting since the student was already dropped. They said in their roster, the student was still registered. They kept sending the messages. Before submitting students' performance in the Starfish, I had discussions with them, and both wanted to try harder. I felt bad to share their grades with Starfish. I wish I could

				help them more and not force them to drop the class.
Math C044	Correctly perform basic operations on whole numbers, integers, fractions, decimals, and rational numbers. Given a word problem, set up and solve an algebraic equation or inequality of one variable, find the solution, and explain the reasonableness of the answer.	Midterm Exam, Final Exam	Mutsuno Ryan	1. I will introduce fractions earlier and use them throughout the semester. I think that the constant contact with fractions will help the students to not be so fearful of them. 2. I will include more topical discussions that are study skilled based so that the students can be successful in college. 3. I would like to collaborate more with other faculty for ideas that make teaching arithmetic more relevant in today's world.
Math C170	Given a function, find real and complex roots to solve, graph, and model polynomial and trigonometric equations and decompose a rational expression	Final Exam; final course grade	Jessica Kuang John Ryan	1.Provide live review sections, so students could be better prepared for the exams. 2.Reach out to the students early in the semester, so maybe we could achieve 100% success rate. 3. I will focus on the basic sine, cosine, and tangents graphs. The other three are not used as much in preparation for calculus. 4. I will continue to include more class time with partial fraction decomposition. This is used in calculus II and is much easier if it is the students' second time seeing it.
Math C140	1. Adequately explain thinking and mathematical processes and justify mathematical solutions effectively and accurately. 2. Use limits, derivatives, and integrals to apply methods of calculus in business and other real-world applications.	Midterm/Final Exam, and Final Course Grade	Mark Cisneros	1. Provide related SLO review questions in the discussion boards to better prepare students for the exams. 2. Reach out to the struggling students earlier in the semester to possibly improve the SLO success rate to 100% in the following semester.

Math 100	Apply mathematics and quantitative reasoning to management of personal finance and other real-world applications 3. Apply the concept of a function; solve and graph quadratic, rational, radical, exponential, and logarithmic functions at a collegiate level.	Midterm & Final Exam Final course Grade	Mike Everett Fred Feldon	1) Continue to use the discussion board assignment seemed to reinforce the concept. 2) The new media assignment along with a follow-up discussion with the students has shown significant improvement in this area. 3) The discussion board assignment addressing common conceptual errors really helps. 4) Seek for affective domain assists. Reiterate the important of time management and making choices between course work and other aspects in students' lives. 5) Increase the use of campus resources such as the Starfish report. 6)Share outcomes and recommendations with other faculty to solicit feedback and finalize recommendations.
Math C180	Apply differential calculus and integration skills to solve problems involving limits, maxima and minima, optimization, and areas bounded by the coordinate axis.	Midterm Exam, Final Exam, and final course grade	Son Nguyen Chau D. Tran	Refine instructional materials specifically for students to utilize to review their understanding in Algebra, especially Algebraic manipulations, and functions. Students are coming in lacking the appropriate understanding about function. Refine instructional materials to help student with a deeper review of Precalculus, Algebra, and Trigonometry. Collaborate with other faculty for ideas that make teaching Calculus more relevant in today's world.

Aggregate Mathematics Program Student Learning Outcomes (PSLOs), 2015-2016 through 2018-2019

Mathematics PSLOs	**N**	**Able and Confident**	**Able and Somewhat Confident**	**Able and Not Confident**	**Not Able**
Adequately explain thinking, mathematical processes and justify mathematical solutions effectively and accurately.	0	0.0%	0.0%	0.0%	0.0%
Select and apply correct quantitative methods to find the correct solution to a problem in familiar or unique situations or contexts.	0	0.0%	0.0%	0.0%	0.0%

There are not enough respondents (less than 10) to the aggregate post-graduation survey for the Mathematics Program to produce meaningful data.

Program Awards

Awards	2014-15	2015-16	2016-17	2017-18	2018-19
Degrees (Coastline Total)	1,609	1,893	2,074	2,025	2,188
Subject Degrees Awarded	3	2	4	2	3
Certificates (Coastline Total)	692	600	602	628	709
Subject Certificates Awarded	0	0	0	0	0

The percentage change in the number of Mathematics degrees awarded in 2018-19 showed a substantial increase from 2017-18 and a minimal difference from the number of degrees awarded in 2014-15.
The percentage change in the number of Mathematics certificates awarded in 2018-19 showed no comparative data from 2017-18 and showed no comparative data in comparison with the number of certificates awarded in 2014-15.

Curriculum Review

Among 23 courses listed below, most courses have been revised for minor revisions, except Math 170, which is in process of requesting minor revision in the fall 2020. In compliance of AB 705, Math Department is not offering those math courses that are less than Math C030. In fall, 2020, math department has offered five college level math courses without prerequisites. Four of them are Math C160, Introduction Statistics with Support, Math C096, and one class of College Algebra, Math C115 with Support, Math C091. If AB 705 continues to the next year, math department will consider further action to request the suspension of those course with the lower level than Math C030.

Curriculum Review

Course	Title	Term Reviewed	Status
MATH 005	Basic Mathematics	Fall 2020, Revision	Inactive
MATH 008	Pre-Algebra	Fall 2016	Inactive
MATH 010	Elementary Algebra	Spring 2015	Inactive
MATH 030	Intermediate Algebra	Summer 2017	Active
MATH 045	Combined Elementary and Intermediate Algebra	Spring 2015	Active
MATH 046	Statistics Pathway 1	Fall 2016	Active
MATH 091	Support for College Algebra	Spring 2019	Active
MATH 096	Support for introduction to Statistics	Spring 2019	Active
MATH 100	Liberal Arts Mathematics	Fall 2015	Active
MATH 103	Statistics for Elementary Teachers	Spring 2015	Active
MATH 104	Mathematics for Elementary Teachers	Spring 2018	Active
MATH 106	Geometry for Elementary Teachers	Spring 2015	Active
MATH 115	College Algebra	Spring 2018	Active
MATH 120	Trigonometry	Spring 2018	Active
MATH 140	Business Calculus	Fall 2018	Active
MATH 146	Statistics Pathway 2	Fall 2016	Active

Course	Title	Term Reviewed	Status
MATH 150	Finite Mathematics with Applications	Spring 2015	Active
MATH 160	Introduction to Statistics	Fall 2019	Active
MATH 170	Pre-Calculus	Fall 2020, Revision	Active
MATH 180	Calculus 1	Spring 2018	Active
MATH 185	Calculus 2	Spring 2016	Active
MATH 280	Calculus 3	Spring 2018	Active
MATH 285	Introduction to Linear Algebra and Differential Equations	Spring 2018	Active

Progress on Initiative(s)

Progress on Forward Strategies

Initiative(s)	Status	Progress Status Description	Outcome(s)
Explore ways to combine math courses, develop new math courses, and offer math courses across different modalities.	Two full time faculty have been requested since 2017-2018	Two full time faculty positions are not filled. (One full time faculty retired on June 1, 2020)	Not completed
Support the continuous improvement in the AB-705 implementation in alignment to Coastline Pathways	Mobile furniture in classroom, Zoom Live online teaching	Due to COVID-19, refresh faculty computer/supply, offer Zoom online classes workshop are needed	Not completed
Strengthen Partnership with Student Success Center	Math Lab/ Assistance by a math faculty	Limited- hour online Net Tutor	Not completed

Response to Program and Department Review Committee Recommendation(s)

Progress on Recommendations

Recommendation(s)	Status	Response Summary
Initiatives should be singular-one proposed initiative is actually three different ones. Difficult to assess as a group.	Addressed	The priority is stated. Please use the Priority 1 to assess as a group.
Look to make short-term certificates	In-progress	To be discussed in the coming full-time faculty Math Department meeting

Program Planning and Communication Strategies

The program meets twice a semester to discuss the SLOs with all the full-time and part-time faculty. Every other week (Thursdays) there is a lunch meeting to discuss the program, innovative practices, problem solving and general operations. The department also hosts a mid-semester meeting to ensure that the faculty are on track in their courses and to collaborate and share ideas. Zoom meeting has been adopted while the meeting cannot be face to face in person. In addition, Math Faculty Resource Discussions board in Canvas is another way to communicate with all the faculty on program planning for the Math department.

Coastline Pathways

Different faculty members have participated in the Coastline Pathways events. The program is very interested in the structured pathway (program mapping) for the Mathematics AD-T and faculty advising. Math Department website has been updated according to the structured pathway to help students.

Implications of Change

The data shows that there are few numbers of first-time to college student seeking an AD-T in Mathematics. Similarly, the results show the College awards an average of three Mathematics AD-Ts annually (2016-17 and 2018-19). Currently, the program has structured pathways to ensure that students will complete the Mathematics AD-T within two to three years. Therefore, a need exists to outreach the Math AD-T to students through the College counselors and online faculty advising.

Section 2: Human Capital Planning

Staffing

Staffing Plan

Year	Administrator /Management	F/T Faculty	P/T Faculty	Classified	Hourly
Previous year	Dean	5	28		
Current year	Dean	4	24		
1 year	Dean	5	24		
2 years	Dean	6	25		
3 years	Dean	6	26		

In 2017-18 and 2018-19 a math faculty position was request but not funded. It is anticipated that there will be growth in the part-time pool in two to three years and the growth in college enrollments and pathways supports the need for new full-time positions 2020. Additionally, as the college move towards guided pathways, there is a continuous need to meet the general education requirement of quantitative reasoning and provide support to the continuous development of supplemental and contextualized courses. In addition, a full-time faculty has retired on June 1st, 2020. Therefore, an urgent hiring need to replace this full-time faculty member, who has strong background in teaching online or Zoom Live setting. As the data from the survey shows a clear picture that Mathematics courses made up 10.0% of all state-funded enrollment for 2018-19. Enrollment in Mathematics during 2018-19 showed 75.9% were taught **online** modality.

Professional Development

Professional Development

Name (Title)	Professional Development	Outcome
Lisa Lee, Fred Feldon, Mitchell Alves, Son Nguyen, Hao-Nhien Vu	American Mathematical Association for Two -Year Colleges (AMATYC)	Learned about innovative teaching strategies and equity teaching online
Lisa Lee, Fred Feldon, Mitchell Alves, Hao-Nhien Vu	AB 705 Workshop	Workshops and Presentations on In-class and Post-class
Lisa Lee, Fred Feldon, Mitchell Alves, Son Nguyen, Hao-Nhien Vu	CMC3 South	Workshops on AB 705 and MyOpenMath, and Equity in teaching
Nigie Shi Jessica Kuang	CMC3 North	Workshops on AB 705, OER, and innovation in teaching
Lisa Lee	Coastline Pathway and Innovation	Structured Pathway mapping and innovative ideas in education

To effectively develop a fully online structured Mathematics AD-T pathway that incorporates faculty advising, contextualized courses, and utilizes interactive technology there is a clear need for an additional full-time tenured faculty member. An experienced online teaching faculty has retired, a replacement is needed. In addition, to completely develop and implement the new structured pathway model in Mathematics, there is a need for faculty to participate in professional development to learn best practices and adopt new tools for ensuring program success, especially for those faculty who used to teach face-to face classes, must attend pedagogy and technology workshops for Zoom Live online teaching.

Section 3: Facilities Planning

Facility Assessment

Before COVID-19 breakout in March 2020, math is taught at all college learning centers, Early College High School, and online. An ongoing request since 2014-15 is to invest in mobile classroom furniture to promote an active learning environment has never been accomplished. In Fall 2019, the sample mobile furniture was displayed at College Center; faculty were invited to review and select the style. Unfortunately, the mobile classroom furniture has never been delivered. With this virus emergency, all the onsite classroom is closed. The faculty has been forced to teach Zoom Live online. Some faculty need refresh their computers and increase computer supply to perform their work at home. Urgently changed the program facilities.

To effectively develop contextualized course and utilizes interactive technology and equipment for Zoom Live online teaching, there is need to provide all faculty for their computer/supply needs. Offer workshops to help those faculty have never been teaching online via Zoom.

Section 4: Technology Planning

Technology Assessment

In spring 2017, the department obtained smartcard to teach MATH C115 and has shown positive increases in student success. In fall 2017, the department adopted my open math (MOM) as free open-source online math course management system. The system has been embedded into Canvas to support course instruction. In 2018-19, the department was one of the first in the state to offer AB-705 related and support courses online. In 2019-2020, College Algebra for AB 705 adopted zoom live meeting in the online course, has shown a substantially increase of success and retention rates. Calculus classes have adopted digital 3D models software. The online remotely proctoring tool - Proctorio has been adopted, and Desmos online software have been used in Calculus courses. The new technology adoption has created create a more inclusive and effective learning and working environment for those who are used to teach online. After the Covina-19 breakout, the faculty who teach face-to-face classes are forced to go Zoom live setting. Most of them are not ready to fully utilize online teaching tools, lack of computer storage capacity, Wi-fi, and any other computer setting problems for heavy usage at home. Some faculty complained that there is no effective working environment to perform the duty as a full-time instructor.

To effectively develop a fully online structured Mathematics AD-T pathway that incorporates faculty advising, contextualized courses, and utilizes interactive technology for those who are teaching via Zoom. Continue searching for more secured with integrity of online proctoring tool is needed.

Section 5: Ongoing/New Initiatives

Initiative: Initiative Priority 1: Explore ways to combine math courses, develop new math courses, and offer math courses across different modalities with innovation to accommodate the needs of all students for diversity, equity, and inclusion. Two full-time positions have been requested in 2017-2018 and 2018-2019, but the positions never filled. An online full-time instructor has retired.

Describe how the initiative supports the college mission:

The initiative supports the College mission. With an additional full-time math faculty who will devote and guide diverse populations of students toward the attainment of associate degrees and certificates leading to career advancement, personal empowerment, and transfer. By meeting students where they are, the full-time faculty can provide innovative instruction and services designed to achieve equitable outcomes.

What college goal does the initiative support? (New Vision 2025 goals to be added)

☒ Reduce all student equity gaps regarding access and achievement (Equity)

☒ Increase student completion and achievement outcomes (Achievement)

☒ Strengthen College collaboration, communication, continuous learning, and community engagement (Engagement)

☒ Further develop, adopt, and adapt innovative practices and technologies that advance student success and institutional effectiveness (Innovation & Effectiveness)

How does this initiative play a part in Coastline Pathways?

The innovative ideas of new full-time math faculty can be added to strengthen the structured Math mapping model in Coastline Pathway. It will benefit students to have an equitable and successful learning experience to reach their goals. The direct alignment to Coastline Pathways is in both Phase 1, including learning communities, holistic wellness, academic persistence, communication, and engagement; and Phase 2, including student outreach and recruitment, and student success.

What evidence supports this initiative? Select all that apply

☒ Learning Outcome (SLO/PSLO) assessment

☒ Internal Research (Student achievement, program performance)

☐ External Research (Academic literature, market assessment, audit findings, compliance mandates)

Describe how the evidence supports this initiative.

It provides access and equity, supports student success and achievement, encourages active learning by full-time faculty with "full time" commitment and dedication in teaching, and creates innovative learning environments to students. This will also increase equity in the classroom and benefit all ages, genders, ethnicities, and students of all socioeconomic backgrounds.

Recommended resource(s) needed for initiative achievement:

Hopefully, the funding resource is available for the replacement of this full-time faculty, who retired on June 1st, 2020.

What is the anticipated outcome of completing the initiative?

- Reduce all student equity gaps regarding access and achievement
- Increase student completion and achievement rates
- Further develop, adopt, and adapt innovative practices and technologies that advance student success and institutional effectiveness

Provide a timeline and timeframe from initiative inception to completion.

Job announcement is ready in March 2021 and hiring process to be completed in early Summer, 2021.

Section 6: Prioritization

List and prioritize initiative requests.

Initiative	Resource(s)	Est. Cost	Funding Type	Health, Safety Compliance	Evidence	College Goal	Complete By	Priority
Explore ways to combine math courses, develop new math courses, and offer math courses across different modalities.	Two Full-time Faculty (one of them is the replacement for a retiree)		Ongoing	No	Internal Research, External Research, SLOs	Student Success, Completion, and Achievement; Student Retention and Persistence	2021-22	1
Support the continuous improvement in the AB-705 implementation in alignment to Coastline Pathways	Assessment software (Gradescope) and Webcam		One-Time	No	Internal Research, External Research, SLOs	Student Success, Completion, and Achievement; Student Retention and Persistence	2021-22	2
Improve Tutoring services with Student Success Center	Math Lab/ Assistance Center by a math faculty		Ongoing	No	Internal Research, External Research, SLOs	Student Success, Completion, and Achievement; Student Retention and Persistence	2021-22	3

Prioritization Glossary

Initiative: Provide a short description of the plan
Resource(s): Describe the resource(s) needed to support the completion of the initiative
Est. Cost: Estimated financial cost of the resource(s)
Funding Type: Specify if the resource request is one-time or ongoing
Health, Safety Compliance: Specify if the request relates to health or safety compliance issue(s)
Evidence: Specify what data type(s) supported the initiative (Internal research, external research, or learning outcomes)
College Goal: Specify what College goal the initiative aligns with
Complete By: Specify year of anticipated completion
Priority: Specify a numerical rank to the initiative

Data Glossary

Enrolled (Census): The official enrollment count based on attendance at the census point of the course.
FTES: Total **full-time equivalent students** (FTES) based on enrollment of resident and non-resident students. Calculations based on census enrollment or number of hours attended based on the type of Attendance Accounting Method assigned to a section.
FTEF30: A measure of productivity that measures the number of **full-time faculty** loaded for the entire year at 30 Lecture Hour Equivalents (15 LHEs per fall and spring terms). This measure provides an estimate of full-time positions required to teach the instruction load for the subject for the academic year.
WSCH/FTEF (595): A measure of productivity that measures the weekly student contact hours compared to full-time equivalent faculty. When calculated for a 16-week schedule, the productivity benchmark is 595. When calculated for an 18-week schedule, the benchmark is 525.
Success Rate: The number of passing grades (A, B, C, P) compared to all valid grades awarded.
Retention Rate: The number of retention grades (A, B, C, P, D, F, NP, I*) compared to all valid grades awarded.
Fall-to-Spring Persistence: The number of students who completed the course in the fall term and re-enrolled (persisted) in the same subject the subsequent spring semester.
F2S Percent: The number of students who completed a course in the fall term and re-enrolled in the same subject the subsequent spring semester divided by the total number of students enrolled in the fall in the subject.