

Instructional Comprehensive Program Review: Math Program Review 2021

Cover

Overview

Title Math Program Review 2021

Year of Last Comprehensive Review

Year of Last Mini Update, if applicable

Originator Erickson, Shanna

Area Dean Antoinette Herrera

Division

Math, Sci. & Engineering

Department

Mathematics

Subject

- MATH - Mathematics

Is this a review for a degree/certificate or all the courses in the subject?

All Courses

Courses with no Degree or Certification

Co-Contributors

*Co-Contributor must be chosen before proposal is launched

- Anderson, Sylvia
- Burnham, Cynthia
- Cong-Huyen, Laimi
- Herrera, Antoinette
- Knight, Robert
- Ky, Teck
- Lombard, Robert
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- Vanniasegaram, Sithparran

Overview

With equity, opportunity and social justice as our guiding principles, Evergreen Valley College's mission is to empower and prepare students from diverse backgrounds to succeed academically, and to be civically responsible global citizens.

1. Student-Centered: We provide access to quality and efficient programs and services to ensure student success.

- Access
- Curriculum and programs
- Services

2. Community Engagement: We will transform the college image and enhance partnerships with community, business and educational institutions.

Areas of focus are:

- Increase visibility
- Develop strategic partnerships
- Building campus community

3. Organizational Transformation: We create a trusting environment where everyone is valued and empowered.

Areas of focus are:

- Communication
- Employee development
- Transparent Infrastructure

Related Assessments

- **1. Provide a brief summary of your program. Please include a brief history and discuss any factors that been important to the program's development.**

With the founding of EVC in 1975, the Mathematics Department started offering courses in mathematics to provide a foundation for quantitative analysis, discovery, life-long learning, and reasoning. Our department is comprised of a diverse group of faculty. We offer courses from developmental to transfer-level mathematics. In addition, the program contributes to the Evergreen Valley College (EVC) mission by providing:

- courses that satisfy degree requirements
- skills necessary to complete a number of occupational programs
- transfer requirements
- coursework that fosters student growth and achievement
- an atmosphere that celebrates cultural diversity, particularly through the Mathematics and Science Resource Center (MSRC), which is strongly supported by the math program.
- Our Math AS-T (Associate Science for Transfer) program has been growing since the last program review. The number of students who graduated with an AS-T in Mathematics has increased significantly, especially in the three years of 2017 – 2020; 29 to 50 students completed the AS-T degree in Math each year. New courses have been added to the program to give students in the program more options. For the program assessment, the department needs to establish better consistency in course content from instructor to instructor in all courses with emphasis on the new common core forms of assessment. During the pandemic time, the department had a chance to design distance education courses for the Math AS-T degree. As of this review, we have seen no distance education data to assess the status and adequacy of those courses. While we would like to attract more students to the college and provide better access, we will maintain the course standard and increase the students' success. Different teaching modalities for high level math courses have been discussed in the department among math faculty.

- The department has faced recent challenges surrounding the implementation of AB-705. Over three years ago (<https://assessment.cccco.edu/ab-705-implementation>), then California Governor Jerry Brown signed AB 705 (a legislative bill) (https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB705) on October 13, 2017, and took effect January 1, 2018. AB 705 has had a significant impact on Math departments in community colleges across the state of California. Two months after the bill went into effect, the SJECED held its first meeting (https://sjeccd.sharepoint.com/leadership-resource-documents/Shared%20Documents/03-14-2018%20Leadership%20Meeting%20Documents/03-14-2018_LeadershipMeetingNotes.pdf) to address AB 705. Since then, the EVC Math Department has worked very hard over the last three and a half years to comply with AB 705. The bill requires that we maximize the number of students who successfully reach and complete transfer level math courses within 1 year. This has led to the elimination of several of our basic skills courses (MATH 310, 311, 111, 014, and most of MATH 013). The mathematics department has had to develop new strategies to help our students with weak mathematics backgrounds. We developed MATH 063X and 021L to support students in MATH 063 and 021, respectively.
 - We created MATH 066/067/070 to give students in the AS-T program more options and to support other programs such as AS-T Computer Science, AS-T Chemistry, and AS-T Physics.
- **2. Please provide an update on the program's progress in achieving the goals (3 years) set during the last comprehensive program review.**
 - The math department was able to transition into remote teaching during this pandemic since mid-Spring 2020 and most math sections are offered in-person starting Fall 2021.
 - As discussed later in Part G, our department has worked very hard over the last three and half years to help the college comply with AB 705 (since Spring 2018). We have faced these challenges by striving to find better ways to help students with weak mathematics backgrounds. For example, we have created new courses (MATH 021L, MATH 063X, and MATH 016) and significantly decreased the number of developmental Math sections we offer (from fifty-seven in Fall 2017 to three in Fall 2021). These efforts have helped to close equity gaps, which is consistent with the College's mission.
 - We created MATH 066/067/070 to give students in the AS-T program more options and to support other programs such as AS-T Computer Science, AS-T Chemistry, and AS-T Physics.
 - From 2014 – 2020 the productivity score of the math department has consistently been the highest on campus (17.9 compared to the campus average of 14.5 from 2020).

Because there are currently many gaps in different areas, we have several future objectives:

- We will continue to update the mission and vision statement for the Mathematics Department as needed. These should be aligned to the college mission and goals of the division and the college.
- We have increased success rates for African American students from under 50% to 50%. Our success rates for Latinx students have decreased from 60% to 50%. We will continue to increase success rates for underperforming (less than college average) ethnic groups.
- We have increased completion rates for Latinx from 70% to 78%. Completion rates for African American students decreased from 70% to 63%. We will continue to increase completion rates for underperforming (less than college average) ethnic groups.

- We will continue to narrow the achievement gap between the highest performing group of students and the lowest performing group of students (2% per year).
- We have increased online and hybrid offerings for transfer level courses in order to meet varying student needs for access.
- We currently do not have distance education courses for the Math AS-T degree, but we plan to offer online and hybrid options to attract more students to the college and provide better access.
- We plan to develop a reliable and precise set of assessment instruments for 80% of the courses, including those not usually taught by full time faculty.
- Since the last program review, we tried to lower the class sizes of developmental courses to less than 30 students. The district did not allow us to do this. Furthermore, because of AB 705, we may no longer offer our current developmental courses.
- We have established better consistency in course content and SLOs from instructor to instructor in all courses.
- Prior to 2016, the Mathematics Department had at its disposal a computer lab equipped with mathematical and learning software. In 2016, when the department moved from Acacia to MS3, it was initially provided with a computer lab, but this lab was subsequently used for Computer Science classes and became inaccessible to Mathematics students and faculty. If we are given space for a math computer lab and other requested technology, we will be able to employ better technology in the classrooms (in addition to much better classroom designs), from software to hardware, to make the educational environment of the classroom more collaborative and cooperative and, consequently, more conducive to student success.
- We have not been able to increase the percentage of developmental courses to be taught by full-time faculty. AB 705 has made it impossible to offer these courses. We plan to develop non-credit courses to replace these developmental courses and to support our transfer level courses.
- We will continue to offer more professional development in the area of learning theory and cooperative learning. This is a must for all faculty (including adjunct instructors). Many of our instructors appear to use a lecture format which may in itself be inadequate to the needs of our students (learning style). Indeed, the cognitive load caused by this lecture format may be hampering the progress of our lowest-performing students, thus increasing the already wide achievement gap between ethnic groups.
- We will continue to provide robust professional development activities for all faculty, tutors, and staff for Mathematics first level of transfer courses. This will give faculty the tools to implement educational, student-centered pedagogies that foster student success, including adult learning theory, cognitive learning strategies,

collaborative and cooperative learning strategies.

- We were denied the ability to provide load reduction to the faculty member who coordinates SLO efforts (coordinating assessment in 30 sections is not trivial).
- We have developed new interventions, including support courses, summer bridge programs, supplemental instruction, Statway (a Statistics curriculum that is systematically integrated with Algebra support), to increase success, retention, completion, and transfer rates.
- We will continue to obtain disaggregated student data per strand and better access to cohort data to identify learning gaps and to monitor completion and student progress at each stage of a pathway.
- We will continue to build a culture of evidence in which practitioners have robust and complete information in order to evaluate the progress and success of educational interventions and to more precisely identify achievement gaps. Moreover, the findings of program reviews need to be used for budget allocation and integrated planning.
- We will continue to review and refine program review processes to ensure that they are systematic, linked to institutional planning, resource allocation, and used to assess and improve student achievement.
- Last but not least, the Mathematics Department (staff and faculty) will continue to work on performance metrics that measure progress towards the future goals of the department. Our goals have included continued use of a student learning outcome assessment for gauging student achievement. Faculty need to be trained in multiple measures of student learning outcome achievement, such as item analysis, indirect assessment, and authentic assessment. This performance-based conception of assessment lies at the heart of what is needed to translate the Mathematics courses into a robust curriculum and assessment system at EVC.

• **3. Please state and recent accomplishments for your program and show how it contribute to the College's mission and success.**

- The math department was able to transition into remote teaching during this pandemic since mid-Spring 2020 and most math sections are offered in-person starting Fall 2021.
- As discussed later in Part G, our department has worked very hard over the last three and half years to help the college comply with AB 705 (since Spring 2018). We have faced these challenges by striving to find better ways to help students with weak mathematics backgrounds. For example, we have created new courses (MATH 021L, MATH 063X, and MATH 016) and significantly decreased the number of developmental Math sections we offer (from fifty-seven in Fall 2017 to three in Fall 2021). These efforts have helped to close equity gaps, which is consistent with the College's mission.
- We created MATH 066/067/070 to give students in the AS-T program more options and to support other programs such as AS-T Computer Science, AS-T Chemistry, and AS-T Physics.
- From 2014 – 2020 the productivity score of the math department has consistently been the highest on campus (17.9 compared to the campus average of 14.5 from 2020).

Because there are currently many gaps in different areas, we have several future objectives:

- We updated the mission and vision statement for the Mathematics Department as needed. These should be aligned to the college mission and goals of the division and the college.
- We increased success rates for African American students from under 50% to 50%. We will continue to increase success rates for underperforming (less than college average) ethnic groups.
- We increased completion rates for Latinx from 70% to 78%. We will continue to increase completion rates for underperforming (less than college average) ethnic groups.
- We increased the number of students in the AS-T program.
- We increased online and hybrid offerings for transfer level courses in order to meet varying student needs for access.
- We established better consistency in course content and SLOs from instructor to instructor in all courses.
- We offered more professional development in the area of learning theory and cooperative learning. This is a must for all faculty (including adjunct instructors). Many of our instructors appear to use a lecture format which may in itself be inadequate to the needs of our students (learning style). Indeed, the cognitive load caused by this lecture format may be hampering the progress of our lowest-performing students, thus increasing the already wide achievement gap between ethnic groups.
- We provided robust professional development activities for all faculty, tutors, and staff for Mathematics first level of transfer courses. This will give faculty the tools to implement educational, student-centered pedagogies that foster student success including adult learning theory, cognitive learning strategies, collaborative and cooperative learning strategies.
- We developed new interventions including support courses, courses to support other programs, summer bridge programs, supplemental instruction, Statway, to increase success, retention, completion, and transfer rates.
- We obtained disaggregated student data per strand and better access to cohort data to identify learning gaps and to monitor completion and student progress at each stage of a pathway.
- We built a culture of evidence in which practitioners have robust and complete information in order to evaluate the progress and success of education interventions and to more precisely identify achievement gaps. Moreover, findings of program reviews need to be used for budget allocation and integrated planning.
- We reviewed and refined program review processes to ensure that they are systematic, linked to institutional planning, resource allocation, and used to assess and improve student achievement.

- We worked on performance metrics that measure progress towards the future goals of the department. Our goals have included continued use of a student learning outcome assessment for gauging student achievement. Faculty need to be trained in multiple measures of student learning outcome achievement, such as item analysis, indirect assessment, and authentic assessment. This performance-based conception of assessment lies at the heart of what is needed to translate the Mathematics courses into a robust curriculum and assessment system at EVC.

- **4. If you received resource allocation for your last program review cycle, please indicate the resources you received and how these resources were utilized to impact student success and / or importance to your program. (The resources can be personnel or fiscal)**

- The math department did not receive any recourse allocation for the last program review.

- **5. Please describe where you would like your program to be three years from now (Program goals) and how the college mission, strategic Initiatives and student success.**

Because there are currently many gaps in different areas, we have several future objectives:

- We will continue to update the mission and vision statement for the Mathematics Department as needed. These should be aligned to the college mission and goals of the division and the college.
- We will continue to increase success rates for underperforming (less than college average) ethnic groups.
- We will continue to increase completion rates for underperforming (less than college average) ethnic groups.
- We will continue to narrow the achievement gap between the highest performing group of students and the lowest performing group of students (2% per year).
- We will continue to increase online and hybrid offerings for transfer level courses in order to meet varying student needs for access.
- We currently do not have distance education courses for the Math AS-T degree, but we plan to offer online and hybrid options to attract more students to the college and provide better access.
- We plan to develop a reliable and precise set of assessment instruments for 80% of the courses, including those not usually taught by full-time faculty.
- We will continue to develop better consistency in course content and SLOs from instructor to instructor in all courses.
- Prior to 2016, the Mathematics Department had at its disposal a computer lab equipped with mathematical and learning software. In 2016, when the department moved from Acacia to MS3, it was initially provided with a computer lab, but this lab was subsequently used for Computer Science classes and became inaccessible to Mathematics students and faculty. If we are given space for a math computer lab and other requested technology, we will be able to employ better technology in the classrooms (in addition to much better classroom designs), from software to hardware, to make the educational environment of the classroom more collaborative and cooperative and, consequently, more conducive to student success.
- We have not been able to increase the percentage of developmental courses to be taught by full-time faculty. AB 705 has made it impossible to offer these courses. We plan to develop non-credit courses to replace these developmental courses and to support our transfer level courses.

- We will continue to offer more professional development in the area of learning theory and cooperative learning. This is a must for all faculty (including adjunct instructors). Many of our instructors appear to use a lecture format which may in itself be inadequate to the needs of our students (learning style). Indeed, the cognitive load caused by this lecture format may be hampering the progress of our lowest-performing students, thus increasing the already wide achievement gap between ethnic groups.
- We will continue to provide robust professional development activities for all faculty, tutors, and staff for Mathematics first level of transfer courses. This will give faculty the tools to implement educational, student-centered pedagogies that foster student success, including adult learning theory, cognitive learning strategies, collaborative and cooperative learning strategies.
- We will maintain new interventions, including support courses, summer bridge programs, supplemental instruction, Statway (a Statistics curriculum designed with systematic integration of Algebra), to increase success, retention, completion, and transfer rates.
- We will continue to obtain disaggregated student data per strand and better access to cohort data to identify learning gaps and to monitor completion and student progress at each stage of a pathway.
- We will continue to build a culture of evidence in which practitioners have robust and complete information in order to evaluate the progress and success of educational interventions and to more precisely identify achievement gaps. Moreover, the findings of program reviews need to be used for budget allocation and integrated planning.
- We will continue to review and refine program review processes to ensure that they are systematic, linked to institutional planning, resource allocation, and used to assess and improve student achievement.
- We will continue to work on performance metrics that measure progress towards the future goals of the department. Our goals have included continued use of assessments to improve student achievement. Faculty need to be trained in multiple measures of student learning outcome achievement, such as item analysis, indirect assessment, and authentic assessment. This performance-based conception of assessment lies at the heart of what is needed to translate the Mathematics courses into a robust curriculum and assessment system at EVC.

Program Set Standards (Summary Tab)

Overall, EVC’s Institution Set Standard for success rate is 72%, and the aspirational goal for student success is 75%.

Success Rate (completion with "C" or better)	Program	EVC	Program Set Standard (established during last comprehensive PR)	Program Success Goal (new)
F'14-F'20 average		71.10%		

Courses with no Degree or Certification

Program Success Rate 59.9%

Program Set Standard: It is recommended that programs identify a success standard. This standard should reflect the baseline success rate.

Program Set Standard 54.5% (S19-F20)

Recommendation: 90% of the 2 year average success rate could be your program standard (average x 0.9).

Program Success Goal: It is recommended that programs identify a success goal. This goal should reflect the success rate to which your program aspires.

Program Success Goal 70%

- **Is your program success rate higher or lower than the campus?**

Our Program Success Rate from Fall 2014 to Fall 2020 has been consistently LOWER than that of the campus.

- **If your success rate is higher than the campus, how are you helping students succeed in and outside the classroom? If your program success rate is lower, what are some strategies your program is implementing to improve?**

This may be due to a wide variety of factors ranging from the overall greater difficulty of the Mathematics curriculum as compared to other disciplines, the passage of AB 705 which eliminated the requirement of remedial courses when indicated and necessary, AND a pandemic which has eliminated the ability for students to attend face-to-face classes as well as get face-to-face help from resources like the Math Science Resource Center (MSRC). With the implementation of AB 705, students often need to retake a transfer level course before they are able to pass. This brings down our overall success rate and retention rate.

Our department has designated lead instructors for each mathematics course. Lead instructors create recommended SLO questions to be assessed for all the sections of the course to standardize course content. Additionally, our department regularly reviews our Student and Program Learning Outcomes in order to identify weaknesses and improve course materials. Finally, our department faculty members participate in Early Alert in order to identify students who may need additional tutoring for our courses.

In 2020, our faculty created MATH 063X and MATH 021L to support students taking Elementary Statistics and Precalculus courses. These supplemental courses are some of our strategies that we are using to increase the success rate in our department.

- **Is the current program success rate higher than the program set standard?**

The current program success rate is higher than the program set standard.

- **How close is the program to meeting the program success goal?**

The more recent measures of the Math program success have shown an upward trend in attaining our success goal. The most recent success rate was within five percentage points of the desired success rate. As our AB 705 strategies become more established and students learn about the offerings of our new support courses (MATH 063X and 021L), student success rates will continue to climb.

- **Are these measures (program set standard and program success goal) still current/accurate? If not, please describe here and reset the standards.**

Yes, the program set standard for program success is still current and accurate.

Success Rates: Measures by IPEDs Race/Ethnicity

- **American Indian**

Program Average Total Enrolled

13.460

Program Success Rate

76.420

- **Asian**

Program Average Total Enrolled

1191.000

Program Success Rate

72.180

- **Black or African American**

Program Average Total Enrolled

75.770

Program Success Rate

49.580

- **Hawaiin/Pacific Islander**

Program Average Total Enrolled

12.150

Program Success Rate

49.860

- **Hispanic**

Program Average Total Enrolled

1388.770

Program Success Rate

49.560

- **Two or More Races**

Program Average Total Enrolled

90.000

Program Success Rate

55.140

- **Unknown**

Program Average Total Enrolled

258.620

Program Success Rate

60.060

- **White**

Program Average Total Enrolled

184.380

Program Success Rate

63.000

Success Rates: Measures by Gender

- **Female**

Program Average Total Enrolled

1625.150

Program Success Rate

62.600

- **Male**

Program Average Total Enrolled

1579.690

Program Success Rate

57.000

- **No Value Entered**

Program Average Total Enrolled

9.460

Program Success Rate

69.440

Success Rates: Measures by Age

- **17 & Below**

Program Average Total Enrolled

87.690

Program Success Rate

82.740

- **18-24**

Program Average Total Enrolled

2366.920

Program Success Rate

56.660

- **25-39**

Program Average Total Enrolled

573.150

Program Success Rate

64.820

- **40 & Over**

Program Average Total Enrolled

184.460

Program Success Rate

74.110

- **Unknown**

Program Average Total Enrolled

2.250

Program Success Rate

58.730

- **a. With respect to disaggregated success rates, list any equity gaps that are identified and discuss interventions your program will implement to address these equity gaps? Please include a timeline of implementation and reassessment.**

The mathematics program success rates are about 11% - 16% less than the rest of campus (see measures by Race/Ethnicity, Gender, and Age). Our program is lower in all the categories. The largest discrepancies are Hispanic (-14.33%, n=9722), Hawaiian/Pacific Islander (-15.93%, n=85), Black or African American (-11.34%, n=985) Men (-11.43%, n=11,058), and 18-24 years old (-11.5%, n=16,569).

To address the equity gaps and to help all mathematics students succeed, the department recommends adding more hours to our Math and Science Resource Center to meet the needs of afternoon, night and weekend students. We also need to have the lab open during Intersessions. We also have office hours on Zoom for students who cannot come to the campus for office hours. Class tutors are currently available, especially sections with a support class, and we want to expand this offering to more sections.

Prior to 2016, the Mathematics Department had at its disposal a computer lab equipped with mathematical and learning software. In 2016, when the department moved from Acacia to MS3, it was initially provided with a computer lab, but this lab was subsequently used for Computer Science classes and became inaccessible to Mathematics students and faculty.

A computer lab for the Mathematics Department is indispensable, as it will provide unique opportunities for instruction and collaboration, promote equity, and prepare students for a workplace that is increasingly technological.

The Mathematics Department currently needs 50 laptops equipped with Math software, such as Minitab, Maple, Matlab, MathType, etc. for use in the classroom, as well as graphing calculators for students. The department also needs laptops/tablets for faculty to use as teaching tools for lectures in classes. Bluetooth-enabled computers and projectors would also help instructors enrich lecture delivery.

We have filled two positions to help close these gaps in collaboration with the Umoja-AFFIRM, and ENLACE programs. Both programs offer MATH 063X and MATH 021L support sections.

These measures will be implemented by Fall 2022 and reassessed in Spring 2023.

- **b. With respect to disaggregated success rates (ethnicity / race, gender and age), discuss student performance in reaching your program set standard for student success as well as reaching the program success goal.**

Although student performance is slightly below the standard set for student success, much of the recent gap may be attributed to AB 705 and the global pandemic. The more recent measures of the Math program success have shown an upward trend in attaining our success goal. The most recent success rate was within four percentage points of the desired success rate. As our AB 705 strategies become more established and students learn about the offerings of our new support courses (MATH 063X and MATH 021L), student success rates will continue to climb.

- **c. If your program offers course sections fully online, please contact the office of Research, Planning and Institutional Effectiveness to obtain a student success report on the online sections. Address any differences in student success rates between fully online courses and classroom courses.**

The average success rate for online math courses is 55.30%. The differences between online courses and face-to-face courses may be due to students not being fully prepared for the commitment required for success in online courses.

It is important to note that these online courses were taken by students during the worldwide pandemic when there was no choice other than online classes. Many of the students taking these online courses may very well have never taken an online math course before, and as such may not have had the proper background and/or understanding of how an online course should be approached.

Program Awards - If Applicable

If the classes in your program lead to a degree or certificate, please visit the DataMart and indicate how many degrees/certificates were awarded in your program:

http://datamart.cccco.edu/Outcomes/Program_Awards.aspx
 (http://datamart.cccco.edu/Outcomes/Program_Awards.aspx)

You will need to select drop down menus and then “select program type by major of study” (for example, select Legal for paralegal studies).

Then at the bottom of the report, select the box “program type- four digits TOP”, then update report to get program specific information.

Degree Type

- **AS-T**

Number of Awards (Examine 2014-15, 2015-16, 2016-17,2017-18 data 2018-19 data and 2019-20 data)

Discussion

Compared to our last program review, the number of students who graduated with an AS-T in Mathematics has increased significantly, especially in the three years 2017 – 2020, from 29 to 50 students completed the AS-T degree in Math each year. However, in the years of 2020 – 2021, the number started declining due to the pandemic happening worldwide. New course offerings (MATH 066/067/070) and increased numbers of other sections in the program are likely contributing to this success. Even though most of the courses in AS-T program (higher level math) are taught by full-time faculty, the department needs to establish better consistency in course content from instructor to instructor in all courses with emphasis on the new common core forms of assessment. During the pandemic, the department had a chance to design distance education courses for the Math AS-T degree. As of this review, we have seen no distance education data to assess the status and adequacy of those courses. While we would like to attract more students to the college and provide better access, we will maintain the course standard and increase the students' success. Different teaching modalities for high level math courses have been discussed in the department among math faculty.

Historically, the Mathematics Department had at its disposal a computer lab equipped with mathematical and learning software that was accessible to Mathematics students and faculty. Since 2016, when the department moved from Acacia to MS3, it was initially provided with a computer lab, but this lab was subsequently used for Computer Science classes and became inaccessible to Mathematics students and faculty.

To continue to grow this number, we would need more support and resources for our program. We greatly need a math computer lab room to provide enrichment to our instruction and better prepare our students. Employing better technology in the classroom from software to hardware will make the educational environment of the classroom more collaborative and cooperative, and consequently, more conducive to student success.

Student Enrollment Types

Related Assessments

Student Enrollment Type: Day or Evening Student

- **Day: 4721 - 51.130%**

Program Average Headcount

3276.000

Program Percentage of Total

55.400

- **Day & Evening: 3111 - 33.690%**

- **Program Average Headcount**

- 2087.000

- **Program Percentage of Total**

- 35.300

- **Evening: 1061 - 11.490%**

- **Program Average Headcount**

- 418.000

- **Program Percentage of Total**

- 7.100

- **Unknown: 341 - 3.700%**

- **Program Average Headcount**

- 131.000

- **Program Percentage of Total**

- 2.200

Student Enrollment Type: Academic Load

- **Full Time: 2259 - 24.450%**

- **Program Average Headcount**

- 2038.000

- **Program Percentage of Total**

- 37.100

- **Half Time or less than half time: 6214 - 67.280%**

- **Program Average Headcount**

- 3452.000

- **Program Percentage of Total**

- 62.900

- **a. Discuss any changes in program enrollment types (day vs evening, full-time vs part-time) since your last program review?**

Annual student enrollment remained pretty consistent between F2014-F2020 (average of 3129 students/year). There was a slight dip (2480 students) in enrollment in Spring 2020 and Fall 2020, which was probably influenced by the "uncertainty" of the pandemic and the required reduction of developmental sections as mandated by AB 705. Our section counts for developmental courses have dropped from at least 40 down to 2. These will be fully eliminated starting in Summer 2022.

Day student enrollment comprised 54% of students, while evening student enrollment comprised 7.1%. 35.3% of students are enrolled in a combination of day and evening courses. Full-time student enrollment comprised 37.1% and half-time and or less than half-time student enrollment comprised 62.9%.

- **b. Discuss how do your program enrollments (Pct of total) compare to EVC?**

Overall program enrollment (Pct of total) has slightly increased for Day and Day & Evening students when compared to EVC. The program enrollment (Pct of total) for the Evening and Unknown is lower when compared to EVC.

- **c. Based on the data, would you recommend any changes?**

The department will work with the dean to open some more night classes, and we are hoping to find faculty to fill those new sections.

Student Demographics - Headcount

Related Assessments

Student Demographic: Gender

- **Female: 5022 - 54.390%**
Program Headcount
 1586.000
Program Percentage of Total
 50.670
- **Male: 4176 - 45.220%**
Program Headcount
 1534.000
Program Percentage of Total
 49.040
- **No Value Entered: 36 - 0.390%**
Program Headcount
 9.000
Program Percentage of Total
 0.280

Student Demographic: Age

- **17 & Below: 465 - 5.000%**
Program Headcount
 87.000
Program Percentage of Total
 2.800
- **18-24: 5542 - 59.990%**
Program Headcount
 2302.000
Program Percentage of Total
 73.520
- **25-39: 2214 - 24.010%**
Program Headcount
 558.000

Program Percentage of Total

17.870

- **40 & Over: 1006 - 10.900%**

Program Headcount

180.000

Program Percentage of Total

5.740

- **Unknown: 9 - 0.100%**

Program Headcount

2.000

Program Percentage of Total

0.070

Student Demographic: Race/Ethnicity (IPEDs Classification)

- **American Indian: 45 - 0.480%**

Program Headcount

13.000

Program Percentage of Total

0.420

- **Asian: 3675 - 39.790%**

Program Headcount

1159.000

Program Percentage of Total

37.260

- **Black or African American: 218 - 2.360%**

Program Headcount

75.000

Program Percentage of Total

2.380

- **Hawaiin/Pacific Islander: 38 - 0.410%**

Program Headcount

12.000

Program Percentage of Total

0.390

- **Hispanic: 3650 - 39.500%**

Program Headcount

1350.000

Program Percentage of Total

42.960

- **Two or More Races: 245 - 2.650%**

Program Headcount

88.000

Program Percentage of Total

2.800

- **Unknown: 773 - 8.390%**

Program Headcount

252.000

Program Percentage of Total

8.040

- **White: 591 - 6.420%**

Program Headcount

180.000

Program Percentage of Total

5.750

- **a. Based on the program total headcount and percent change year to year, discuss if your program growing or declining. If so, what do you attribute these changes in enrollment to and what changes will the program implement to address them?**

The mathematics program is declining. This slight decline may be attributed by the passage of AB 705, which eliminated the requirement for remedial courses when indicated and necessary, AND a pandemic which has eliminated the ability for students to attend face-to-face classes as well as get face-to-face help with resources like the Math Science Resource Center (MSRC).

- **b. Discuss any gaps have you identified in your program. Discuss how your program enrollment is similar or different from the campus. Discuss which gender, age, and/or ethnic group are proportionally smaller than campus make up.**

There seem to be more female students (54.39%) than male students (45.22%) attending courses in the mathematics department; however, the enrollment reflects that of the campus. The two primary ethnic groups are Asian and Hispanic students; however, the enrollment reflects the number of residents living nearby the campus.

- **c. Discuss what interventions the program can implement to address any gaps in enrollment.**

We need to recruit more African American and Latinx students for mathematics courses. We will increase local outreach and work with Umoja-AFFIRM and ENLACE programs to increase recruiting and close enrollment gaps. We will continue to offer program-specific sections to attract more students from these underrepresented groups.

Institutional Effectiveness (5 year average, see Summary Tab)

EVC Capacity: 62.49% EVC Productivity: 14.72

Program Capacity

73.04%

Program Productivity

18.83

Is your capacity rate higher or lower then the campus?

The capacity for the mathematics program is higher then the campus.

Is your productivity goal higher or lower than the campus?

Our program productivity is higher than the campus.

If the program capacity and/or productivity is lower than the campus, please provide rationale:

Curriculum

Related Assessments

Courses with no Degree or Certification

- **1. Identify and updates to curriculum since the last comprehensive program review, including and new programs and indicate the 6-year timeline for scheduled course outline revision. For CTE, the time line is 2 year.**

The curriculum in the Mathematics Department has changed significantly since 2015 due to Assembly Bill No. 705 (Guided Pathways), and updated programs from other departments.

- A. Guided Pathways - In 2015, a guided pathways model was proposed. This model aims to help students clarify and achieve their educational goals by ensuring that colleges align their courses into programs of study. The department has improved courses' schedules and sequencing to make the student experience more streamlined. The math department in 2017 created MATH 064 and MATH 065 – Integrated Statistics I and II with the purpose of helping students to complete statistics faster.
- B. AB 705 - In 2018, AB 705 was signed. It requires California community colleges to maximize the probability that a student will enter and complete transfer-level coursework in math within a one-year timeframe. To be AB 705 compliant, we designed MATH 021L and MATH 063X to provide just-in-time instruction for students who have completed algebra but want to receive additional academic support. The department also created MATH 016 – Algebra with Geometry Concepts for STEM students who need more review in Algebra and Geometry before entering any transfer level math course.
- C. New math courses to support other programs – As the Chemistry and Computer Science Departments expanded in the last couple years, AS-T in Chemistry and AS-T in Computer Science were created. In order to support them, MATH 066 and MATH 067 – Calculus I and II Late Transcendental for STEM were developed to fulfill their requirements. These courses also give more options for students majoring in Math, Physics and Engineering as well. MATH 070 was also reactivated to support the Computer Science Department.
- D. Course Deactivation - While organizing all the courses, MATH 300 – Basic Mathematics Skills and MATH 051 – Mathematics for General Education were removed due to low enrollment. Also, when AB 705 took place, with the requirement of completing transfer-level math within a one year timeframe, we deactivated MATH 310 – Basic Mathematics, MATH 311 – PreAlgebra, MATH 016 - Algebra with Geometry Concepts, MATH 111 - Beginning Algebra (currently in review for deactivation), and MATH 064 and MATH 065 – Integrated Statistics. The last two courses were deactivated because of lack of enrollment.

E. AS-T in Mathematics - Mathematics AS-T has been modified with the change of the courses' curriculum and approved by the state. However, the AA in General Studies with Emphasis in Mathematics for secondary teaching was removed due to low enrollment and the lack of the lead faculty - Steve Matusow - who retired many years ago and has never been replaced.

F. Course Review: All math courses in the department have been updated within the last six years except MATH 078 – Differential Equations – which is in the process of being updated.

G. Timeline for scheduled course outline revision

H.

Course #	Title	Revision Scheduled	Comment
MATH 111	Elementary Algebra	Fall 2022	Deactivation (in review)
MATH 013	Intermediate Algebra	Fall 2022	
MATH 014	Geometry	Fall 2022	Deactivation (in discussion)
MATH 021	Precalculus Algebra	Fall 2025	
MATH 021L	Precalculus Support	Fall 2025	
MATH 022	Trigonometry	Fall 2025	
MATH 025	Precalculus Algebra and Trigonometry	Fall 2025	
MATH 052	Mathematics for Elementary Education	Spring 2023	
MATH 061	Finite Mathematics	Fall 2025	
MATH 062	Calculus for Business and Social Science	Fall 2027	
MATH 063	Elementary Statistics	Fall 2025	
MATH 063X	Statistics Support	Fall 2025	
MATH 066	Calculus I Late Transcendentals for STEM	Fall 2024	
MATH 067	Calculus II Late Transcendentals for STEM	Fall 2026	
MATH 070	Discrete Mathematics	Fall 2026	
MATH 071	Calculus I with Analytic Geometry	Fall 2022	
MATH 072	Calculus II with Analytic Geometry	Fall 2026	
MATH 073	Multivariable Calculus	Fall 2026	
MATH 078	Differential Equations	Fall 2022	
MATH 079	Linear Algebra	Fall 2026	

- **2. Identify all the courses offered in the program and describe how these courses remain relevant in the discipline. For courses your program has not offered in the past two years, please discuss a plan on how to deal with these courses (if your program is not going to de-activate these courses, please explain why).**

Developmental Mathematics Courses

Mathematics 111 – Elementary Algebra

Mathematics 013 – Intermediate Algebra

Mathematics 014 – Geometry

College-level Mathematics

Mathematics 021 – Precalculus Algebra

Mathematics 021L – Precalculus Support

Mathematics 022 – Trigonometry

Mathematics 025 – Precalculus Algebra and Trigonometry

Mathematics 052 – Mathematics for Elementary Education

Mathematics 061 – Finite Mathematics

Mathematics 062 – Calculus for Business and Social Science

Mathematics 063 – Elementary Statistics

Mathematics 063X – Statistics Support

Mathematics 066 – Calculus I Late Transcendentals for STEM

Mathematics 067 – Calculus II Late Transcendentals for STEM

Mathematics 070 – Discrete Mathematics

Mathematics 071 – Calculus I with Analytic Geometry

Mathematics 072 – Calculus II with Analytic Geometry

Mathematics 073 – Multivariable Calculus

Mathematics 078 – Differential Equations

Mathematics 079 – Linear Algebra

Even though many of the students who attend Evergreen Valley College (EVC) are still in dire need of remediation in mathematics, due to AB 705, a large number of developmental math courses has been cut down from the schedule. All sections of MATH 310, MATH 311, MATH 111, and MATH 014 courses are no longer offered. Only 3-4 sections of MATH 013 – Intermediate Algebra are offered each semester since Spring 2020, and two of which are for Special Programs (Enlace and Umoja-AFFIRM). For those students who need additional academic support before taking a transfer-level math course, they can enroll in one of the four sections of MATH 021L-Precalculus Support, and three sections of MATH 063X-Statistics Support.

Students must complete at least one college-level mathematics course to earn an associate degree or transfer to a four-year university to earn a baccalaureate degree. This requirement can be met by completing a course in Precalculus Algebra, Mathematics for Elementary Education, Finite Mathematics, Calculus for Business and Social Science, or Elementary Statistics. Compared to six years ago, the number of transfer-level math courses increased. In Fall 2020, EVC offers seven sections of MATH 021-Precalculus Algebra, one section of MATH 061-Finite Mathematics, three sections of MATH 062-Calculus for Business and Social Science, and 28 sections of Elementary Statistics. Courses in Finite Mathematics and Calculus for Business and Social Science target students majoring in Business. The college offers the 28 sections of Elementary Statistics for students who are majoring in Business, Nursing, or Psychology, as well as students satisfying a general educational requirement.

For students in the STEM fields such as Physics, Chemistry, Engineering, and Computer Science, as well as Mathematics majors, the department increased the number of sections since the last program review. In Fall 2020, EVC offered seven sections of Precalculus Algebra, two sections of Trigonometry, six sections of Precalculus Algebra and Trigonometry, one section of Calculus I (Late Transcendentals), six sections of Calculus I, three sections of Calculus II, three sections of Multivariable Calculus, two sections of Linear Algebra, and one section of Differential Equations.

MATH 070-Discrete Mathematics is a new course that was offered for the first time in Spring 2021.

- **3. If you have a degree or certificate, please include a diagram of your program's guided pathways program map. (A program map indicates courses suggested for each semester, across two years, upon completion a student would qualify for a degree/certificate).**

The Math Department has offered an AS-T in Mathematics. A guided pathways program map has been created as follows.

High School Preparation: Courses in physics, chemistry, four years of high school mathematics are required. If this preparation is not complete, Evergreen Valley College offers courses to meet this preparation. If the preparation is not complete, it may take more than two years to complete this degree.

Term 1	Units	CSU GE	IGETC FOR CSU	NOTES
MATH 071 or MATH 066	4-5	B4	2A	
ENGL 001A	3	A2	1A	
GE	3	A1	1C	
GE	3	C1	3A	
Total Units	13-14			

Term 2	Units	CSU GE	IGETC for CSU	NOTES
MATH 072 or MATH 067	4-5			
GE	3	A3	1B	
GE	3	C2	3B	
GE	3	E	Transferable Elective	
GE	3	D	4	
Total Units	16-17			

Term 3	Units	CSU GE	IGETC for CSU	NOTES
MATH 073	5			
GE	3	C1 or C2	3A or 3B	
GE	3	B2	5B	
GE	3	D	4	US-1, US-2, US-3
Total Units	14			

Term 4	Units	CSU GE	IGETC for CSU	NOTES
MATH 079	3			or MATH 078
PHYS 004A or PHYS 007A	4-5	B1/B3	5A/5C	or other LIST B option
GE	3	D	4	US-1, US-2, US-3
Transferable Electives	4-7			As needed to reach a total of 60 transferable units; MATH 078 strongly recommended
Total Units	15-17			

* CSU Graduation Requirement: Students must complete a set of courses that meet the US-1, US-2 and US-3 American Institutions Requirement

- **4. Identify and describe innovative strategies or pedagogy your department/program developed/offered to maximize student learning and success. How did they impact student learning and success?**

The Mathematics department has continued a wide range of innovative strategies that suit the varied needs and learning styles of our students. Some of these practices include the following:

1. Technological innovation

The web-based course management systems such as MyMathLab, MyStatLab, MyMathText, and Enhanced WebAssign have been incorporated into many of our mathematics offerings. These systems provide an interactive homework component with pre-worked examples, step-by-step interactive problems, selected videos, text references, direct e-mail to the instructor with reference to a particular problem, and quizzes. In addition, students who use MyMathLab are eligible for free phone tutoring in the evening.

Online courses and web mediated courses enable the students to listen to video lessons created by the instructor as well as those created by the authors of online textbooks. These courses make use of electronic texts, costing only a fraction of the cost of traditional textbooks. The number of online and hybrid courses is increasing. In Fall 2020, we offered 2 online/hybrid courses for MATH 025, and 6 online/hybrid courses for MATH 063. The department plans to extend online/hybrid courses in MATH 021, 022, 062, 070.

Since the pandemic took place in March 2020, all math courses needed to convert to synchronous modality, and all faculty are either certified to teach online or have completed 20 hours of the summer training bootcamp to meet the requirement.

2. Honors Projects

In the past, we used to have one of our faculty members supervise honor students' projects in Multivariable Calculus, Differential Equations, and Linear Algebra. These projects address problems which were deeper and more difficult than those typically encountered on these courses. When a student's work is particularly good, the student has an opportunity to present his or her work in a student session at a mathematics conference sponsored by the Mathematical Association of America. However, this faculty retired several years ago and this position has never been replaced.

3. Mathematics Education

The department offers two courses that are directed at future elementary school teachers: Mathematics for Elementary Education, EDU 012, and EDU 013. Students are trained to use mathematics manipulatives and give oral teaching presentations. However, due to lack of faculty and resources, these courses are no longer offered since 2017. Currently, they are in revision for deactivation.

4. Special Program (ENLACE/Umoja-AFFIRM)

ENLACE and Umoja-AFFIRM courses in Mathematics include lectures/ labs that offer hands-on learning in a collaborative, bilingual, and multicultural setting. Group work and culturally relevant, and a mastery approach are some of the features of these classes. Students are required graphing calculators in MATH 013 – Intermediate Algebra and MATH 063 – Statistics. ALEKS, a research-based, online learning program, is also being incorporated into some of these classes. The ENLACE's STEM projects seek to recruit, support and transfer students into STEM careers. Many of these students are working as tutors in the Math and Science Resource Center. MATH 013 sections need to be retained for our special programs.

- **5. Discuss plans for future curricular development and/or program degrees & certificates included) modification.**

In 2011, the department established an Associate Degree for Transfer (AS-T) in Mathematics. During the past years, the department has updated the program several times. The latest version of our AS-T in Mathematics is the following:

I. Statement of Program Goals and Objectives

The Associate in Science Transfer in Mathematics (AS-T) degree is based on the approved Transfer Model Curriculum provided by the Academic Senate for California Community Colleges in accordance to SB1440 and California Education code sections 66746-66749. The Associate in Science in Mathematics for Transfer degree is designed to prepare students to seamlessly transfer into the California State University (CSU) system and complete a baccalaureate degree in Mathematics or similar field of study.

Upon completion of the Associate in Science in Mathematics for Transfer, the student should be able to:

- develop creative and logical solutions to various abstract and practical problems.
- use mathematics to model and solve applied problems in engineering and science.
- demonstrate didactic reasoning to construct elementary proofs to theorems.

II Catalog Description

Mathematics has been an important academic discipline in its own right for over 2500 years. In addition, mathematics provides the foundation for the study of physical, biological, health and computer sciences, engineering, statistics, economics, and many other disciplines. Graduates who complete a baccalaureate degree in Mathematics are prepared for employment as computer programmers, actuaries, data analysts, financial analysts, operations researchers, and educators. Others continue their studies and pursue advanced degrees in business, medicine, and law.

The Associate in Science in Mathematics for Transfer (AS-T) degree is intended for students who plan to complete a baccalaureate degree in Mathematics or a related field of study at a California State University. Students who complete this degree are guaranteed admission to the CSU system, *but not to a particular campus or major*. Students transferring to a CSU campus that accepts the Associate in Science in Mathematics for Transfer will be required to complete no more than 60 semester units after transfer to earn a baccalaureate degree.

To be awarded the Associate in Science in Mathematics for Transfer degree, students must:

(1) Complete 60 semester units or 90 quarter units that are eligible for transfer to the California State University, including both of the following:

(a) The CSU General Education - Breadth (CSU GE - Breadth) or The Intersegmental General Education Transfer Curriculum (IGETC) for California State University (CSU).

(b) A minimum of 18 semester units or 27 quarter units in a major or area of emphasis, as determined by the community college district.

(2) Maintain a minimum grade point average of 2.0.

While a minimum of 2.0 is required for admission, some majors may require a higher GPA. Please consult with a counselor for more information.

Associate Degrees for Transfer (ADTs) also require that students earn a “C” or better in all courses required for the major or area of emphasis. A “P” (Pass) grade is also an acceptable grade for courses in the major if the course is taken on a Pass/No Pass basis.

Students should meet with their counselors as early as possible in order to develop an effective educational plan.

ASSOCIATE IN SCIENCE DEGREE IN MATHEMATICS FOR TRANSFER

REQUIRED CORE COURSES UNITS

MATH 071 Calculus I with Analytic Geometry.....	5.0
MATH 072 Calculus II with Analytic Geometry	5.0
MATH 073 Multivariable Calculus	5.0
OR	
MATH 066 Calculus I Late Transcendentals for STEM	4.0
MATH 067 Calculus II Late Transcendentals for STEM.....	4.0
MATH 073 Multivariable Calculus	5.0

Total Core Units: 13.0 - 15.0

Students must also complete a minimum of six units from Group A and Group B with at least three units (and possibly seven) selected from Group A.

Group A

MATH 078 Differential Equations	4.0
MATH 079 Linear Algebra	3.0

Group B

COMSC 072 or MATH 070 Discrete Mathematics.....	4.0
COMSC 075 Computer Science I: Introduction to Program Structures ..	3.0
MATH 063 Elementary Statistics.....	3.0
PHYS 004A or PHYS 007A General Physics.....	5.0/4.0

Total Required Units: 19-24.0

CATEGORY UNITS

Units in Major.....	19- 24.0
CSU GE or IGETC	37- 39.0
Possible double counting of CSU GE or IGETC.....	3 - 7.0
Transferable Electives for CSU.....	1 - 8.0
Transferable Electives for IGETC.....	3 - 10

Total Units 60.0

Plans for future curricular development and/or program modification

1. AS-T in Mathematics

The AS-T in Math is now currently in review due to the course's deactivation of COMCS 072, and the purpose of a streamlined SLO assessment. MATH 066, MATH 067, MATH 070 have been added to the program, and COMSC 072 has been removed. With the addition of these courses, the program will attract more students since they will have more options to select courses to fulfill their needs (e.g. different variety of courses and/or fewer unit courses). Also, the PLOs will map directly to the core courses MATH 066, 067, 071, 072, 073, 078, 079 only. This update is tentatively scheduled for Fall 2022, which will help us to complete the program assessment in the most effective way for accreditation purposes. We will keep updating the program every six years as required.

2. Course's development

Due to AB 705, most of the basic skills and developmental math courses are either deactivated or no longer offered. MATH 013 used to have the largest enrollment in the past, and now the department can offer only two sections, and it will be removed from the course's schedule in Fall 2022. Since this course is still in great need of our students, the department is in discussion of creating non-credit courses for these math courses, with the hope of helping students, especially in special programs, to close the achievement gap. For all existing courses, we will keep them all updated as scheduled (see Curriculum #1).

- **6. Describe how your program is articulated with High School Districts, and/or other four year institutions. (Include articulation agreements, CID, ADTs...)**

Students who attend middle schools and high schools that feed into the San Jose/Evergreen Community College District can take Precalculus Algebra and Trigonometry, and Elementary Statistics, and receive high school credit. Moreover, students are able to get credit for MATH 071 and MATH 072 by taking the AP Calculus exam.

Precalculus Algebra, Precalculus Algebra and Trigonometry, Finite Mathematics, Calculus for Business and Social Science, Elementary Statistics, Calculus Late I, and II Transcendental for STEM, Calculus I with Analytic Geometry, Calculus II with Analytic Geometry, Calculus I Late Transcendentals for STEM, Calculus II Late Transcendentals for STEM, Multivariable Calculus, Linear Algebra and Differential Equations, all of these courses are all C-ID approved, and transferable to the California State University and the University of California.

Discrete Mathematics is in the progress of obtaining C-ID approval as a math course. While it's not C-ID approval for a computer science course, the department is working with other four-year institutions to get the course articulation. The math department at SJSU has approved our MATH 072 to be equivalent to their MATH 42.

Linear Algebra and Differential Equations are transferable to most of UC and CSU. Some University of California campuses combine Differential Equations and Linear Algebra and give students credit only if they have taken both.

- **7. If external accreditation or certification is required, please state the certifying agency and status of the program.**

This is not applicable since Mathematics is not a vocational program.

Student Learning Outcome and Assessment

Related Assessments

Student Learning Outcomes

Program Learning Outcomes

- **1. On the program level, defined as a course of study leading to degree or certificate, list the Program Learning Outcomes (PLOs), and how they relate to the GE/ILOs (<http://www.evc.edu/discover-evc/student-learning-outcomes-%28slos%29> (<http://www.evc.edu/discover-evc/student-learning-outcomes-%28slos%29>)). Please also indicate how the course SLOs have been mapped to the PLOs. If you are completing this program review as a department or discipline and do not offer any degrees or certificates, please write N/A in this space.**

Associate in Science in Mathematics for Transfer (2MATH.AST.1)

The Associate in Science in Mathematics for Transfer (AS-T) degree is intended for students who plan to complete a baccalaureate degree in Mathematics or a related field of study at a California State University. Students who complete this degree are guaranteed admission to the CSU system, *but not to a particular campus or major*. Students transferring to a CSU campus that accepts the Associate in Science in Mathematics for Transfer will be required to complete no more than 60 semester units after transfer to earn a baccalaureate degree.

Program Learning Outcomes

Upon completion of the Associate in Science in Mathematics for Transfer, the student should be able to:

- Develop creative and logical solutions to various abstract and practical problems.
 - ILO mapping: inquiry and reasoning
- Use mathematics to model and solve applied problems in engineering and science.
 - ILO mapping: communication, and inquiry and reasoning
- Demonstrate didactic reasoning to construct elementary proofs to theorems.
 - ILO mapping: communication, and inquiry and reasoning

The following courses are part of the program that has SLOs being mapped to each PLO. They can be found in CurriQunet.

Mathematics 066 – Calculus I Late Transcendentals for STEM

Mathematics 067 – Calculus II Late Transcendentals for STEM

Mathematics 070 – Discrete Mathematics

Mathematics 071 – Calculus I with Analytic Geometry

Mathematics 072 – Calculus II with Analytic Geometry

Mathematics 073 – Multivariable Calculus

Mathematics 078 – Differential Equations

Mathematics 079 – Linear Algebra

All the courses in the program satisfy the GE requirement (CSU and IGETC). Every PLO has been mapped to at least one of the ILOs (see above). Also, due to the CurriQunet set up, each core course in the program has all SLOs being mapped into each PLO.

The AS-T Program in Mathematics was created in 2011, and just updated recently in 2020. New courses MATH 066, MATH 067, and MATH 070 currently added to the program. The program is currently in review due to the change of courses. Since the last program review, it has attracted a decent number of students to join the program, and the number of students in the program has increased significantly.

Program of Study	F 2015	F 2016	F2017	F 2018	F 2019	F 2020	F 2021
Math AS-T CSU	12	20	42	63	92	144	135
Math AS-T IGETC	2	2	7	17	25	49	45
Grand Total	14	22	49	80	117	193	180

As the data shown, the program has more students each year in the last six years, except last year due to a pandemic. The number of students completing the program also increases overall (<http://datamart.cccco.edu/> (<http://datamart.cccco.edu/>)). It definitely can be better, and on the positive sign, more students have completed degrees currently compared to previous years (again 2020-2021 is the pandemic time).

Program Awards	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
AS-T Math	11	27	36	29	50	32

We do believe that this number will continue increasing each year in the near future, since we have many qualified math students who are willing to become math tutors in the Math and Science Resource Center.

The department has been offering honor student projects in some of our MATH 073, and MATH 078, and MATH 079. After students complete the honor courses, their projects are presented at the Student Mathematics Conference in Northern California sponsored by Mathematics Association of America. However, this program is not offered anymore since Dr. Chungwu Ho, a qualified faculty in charge of this, retired.

For the program SLO's assessment, its matrix (Fall 2015 – Spring 2019) may be found at the link: <http://www.evc.edu/discover-evc/slos> (<http://www.evc.edu/discover-evc/slos>). The assessment was not conducted in the last two year due to COVID 19. Starting this Fall 2021, the results for the PLOs assessment

will be posted via CurriQunet, and the cycle for the assessment is two years, and we will close the loop for the assessment.

The tools we usually used to assess were questions mostly from the tests throughout the semester, and/or the final test. Although students are required to finish 60 units for the completion of the program, only the core math courses such as MATH 071, MATH 72, MATH 073, MATH 078, and MATH 079 have been assessed (MATH 066 and MATH 067 were not created at that time). For SLOs #1 and #2, the results somewhat are acceptable. The success rates for all the core courses in these SLOs are 70% or better. While we plan not to change anything academically in the future, we will continue our efforts to see if better results can be approached. The only concern is that we need to get all faculty involved in order to get all data collected to reflect our true intention. For the SLO#3, the result was not as our expectation due to the nature of difficult type of questions. The department plans to discuss this issue in the next meetings to see if MATH 071, MATH 072, and MATH 073 need to set aside an entire week to practice proofs and to review some logic from high school geometry.

- 2. Since your last program review, summarize SLO assessment activities and results at the course and program level. Please include dialogue regarding SLO Assessment results with division/department/college colleagues and/or GE areas. Provide evidence of the dialogue (i.e. department meeting minutes or division meeting minutes, etc.) Your program review will not be approved unless every SLO for every course in your program, and every PLO (if your program has a degree or certificate) is complete and approved by EVC's SLO Coordinator. All SLOs and PLOs must be assessed every two years.**

A summary of SLO assessment activity and results at the course and program level from Fall 2015 to Fall 2021, are listed below. Evidence of dialogue regarding SLO assessment results with division/department/college colleagues and/or GE areas, can be found in the divisional T-Drive file under Math Program Review.

Please see attached files for individual course SLOs and PLOs.

- 3. What plans for improvement have been implemented to your courses or program as a result of SLO assessment? Please share one or two success stories about the impacts of SLO assessment on student learning.**

Plans for improvement that have been implemented into your courses or program as a result of SLO assessment include the following:

- Provide students with more examples in the form of homework and review worksheets for better comprehension.
- Encourage students to collaborate in groups for increased learning and understanding.
- Emphasize the importance of defining variables when setting-up problems and the order of operations when simplifying and solving.
- Increase time devoted to certain SLO's through lectures, discussions, and group work, and more quizzes.
- Motivate students to attend class regularly and on time, and encourage students to attend in-person and online tutoring.
- Have instructors assess the same or very similar SLO problems/questions in each course.
- Hire an additional math instructor.
- MATH 071, MATH 072, and MATH 073 are offered every semester with multiple sections. We need to ensure that all course syllabi have the same course objectives and current SLOs starting in Spring

2022.

- Since some SLOs cover a lot of different topics, it will be more accurate and more effective if all of these sections for each math class are assessed with the same questions or at least same type of questions on the tests. We just need to make this consistent for all other math courses in the future.
- MAPLE has been installed in the computer lab in MS3. However, it becomes inaccessible to math students and faculty. Prior to 2016, the Mathematics Department had at its disposal a computer lab equipped with mathematical and learning software that was accessible to Mathematics students and faculty. In 2016, when the department moved from Acacia to MS3, it was initially provided with a computer lab, but this lab was subsequently used for Computer Science classes and became inaccessible to Mathematics students and faculty. A computer lab for the Mathematics Department is a necessity, as it will provide unique opportunities for instruction and collaboration, promote equity, and prepare students for a workplace that is increasingly technological. The Mathematics Department currently needs 50 laptops equipped with Maple and Minitab for use in the classroom.
- As many schools now offer online/hybrid courses in Mathematics for the higher level courses, our department has discussed this matter. We did have a chance to offer the courses only synchronously during the pandemic time (Spring 2020 to Summer 2021). We will look at the data to see the student success rates before making a final decision to offer it online, or at least some math courses should be offered hybrids. This might help students to finish the program faster, so that the number of students completing the program will increase.
- Indirect Assessment for the AS-T in Mathematics needs to be implemented soon to gather more information about the quality of student learning and to ensure the program's success.

Two success stories about the impact of SLO assessment on student learning are listed below.

1. Phan Le first took my MATH 072 – Calculus II in Spring 2016 and finished MATH 073 – Calculus III in Fall 2016. I was impressed with his academic potential. He did really well in two courses he took with me. Out of almost 50 students I had for each course, he appeared to be the top student. He had exceptional work habits. Even though he had a very strong background and seemed to know the material well, he never missed any class, and his records for both were outstanding. His work was well organized, punctual, and notable, and mistakes were almost nowhere to be found. I noticed that Phan was working in the Math and Science Resource Center as a tutor for more than one subject. My observation of Phan in class left me with the impression that he could work easily with others, to help others to master the concepts needed. I strongly believe that he is a talented and hardworking tutor who can share his knowledge to benefit the greater part of other students. He showed a student with passion not just in Math but in long term education in general. He went and looked for further academic achievement that would support his future goal. Additionally, Phan participated in the nationwide AMATYC Math Contest. He not only attended every semester in two years at EVC, he also earned a very good score each time. He was even in the top five of the contests. He then later transferred to University of California, Berkeley, to pursue a computer science major. He graduated last year 2020. He is now working at SUSE Company as a software engineer.
2. In Fall 2017, X took my MATH 072. He then continued taking MATH 073 and MATH 079 with me in the following year, 2018. X has been doing well in all of my math classes. He received an A on his first Calculus course with me easily. It wouldn't surprise me if he was as good as other students. To be honest, it was not the best A that I have seen, but what I found in him is really special and unique in which I have never seen in any student in my 20 years of teaching experience. I remember when he took my first exam in my Calculus III in the next semester, he barely passed it. However, when he asked me if I could possibly write him a letter of recommendation later for his application, I promptly agreed, even though my policy of writing this letter is for students getting a grade of A's only. I had a chance to

talk to him a few times, and he shared with me some difficulties and depression that he had been dealing with. Listening to him at that time, I didn't know that he was struggling with autism spectrum disorder, which contributed to his depression sometimes back then. Nevertheless, amazingly, he came back and earned all good grades for the rest of the semester. At the end of his MATH 073, he managed to earn a strong B in my class. B is a good grade, but I do believe that he could do better than that. In fact, his loss in A was due to his missing homework assignments. He later shared with me many things that he was interested in. He loves math and uses it to program. He has been working with different projects, such as setting up a VPN at home and creating an SSH tunnel to connect to his VPN at home to get free Wi-Fi on airplanes by utilizing an open TCP port or running a Minecraft server. He is just a very curious student who is naturally able to figure out all things by himself, and who has the greatest skills at understanding abstract concepts and connecting them to the real world.

From the SLO assessment results, below are a few changes that were implemented to help students to improve and be successful.

- Assigned homework, extra credit/challenge problems and projects that help develop and improve their critical thinking skills while simultaneously assisting them to master the subjects so that they can apply the learning concept to solve real world problems.
- Provided additional group activities and collaboration time, to help students to develop and improve mathematical skills, including communication and reasoning.

Faculty and Staff

Part D: Faculty and Staff

- **1. List current faculty and staff members in the program, areas of expertise, and describe how their positions contribute to the success of the program.**

PART D: Faculty and Staff

1. List current faculty and staff members in the program, areas of expertise, and how positions contribute to the program success.

A. List of Faculty and Staff Members in the Program

1. Faculty Members

Burnham, Cynthia R

Quach, Tin

Ky, Teck

Lombard, Bob

Knight, Robert W

Cong-Huyen, Laimi

Vanniasegaram, Sithparran

Erickson, Shanna

Anderson, Sylvia

2. Staff Members

Pham, Duyen (Bryan)

Nguyen, Nguyet

Marks, Sawanii

Vallin, Jorge

B. Areas of expertise, and how positions contribute to the program success

1. Faculty Members

Burnham, Cynthia R

She teaches online, hybrid and face-to-face courses. She has integrated online learning resources into all her courses to further support student learning and investigated various teaching methodologies with considerations such as student engagement and low-cost materials to improve access. She wrote the curriculum for a new math course, Discrete Mathematics, and offered this class face-to-face in Spring 2021 and will offer it as an online course in Spring 2022. She has also developed online courses in MATH 021, MATH 025, MATH 062, and MATH 063. All her online courses are fully integrated with Canvas and incorporate the latest standards for online teaching. She is lead SLO instructor for MATH 062 and MATH 070. She won the League for Innovation in the Community College Innovation of the Year Award in Spring 2017 for her work developing the Enlace Accelerated Program. She has completed EDIT 022 and attended professional development conferences and workshops, such as OTC, ICTCM, CMC3, and various webinars. She will continue her professional growth through classes and conferences and will continue to develop and innovate online courses.

Quach, Tin

Area of Expertise:

Applied Mathematics

How Does His Position Contribute to Program Success? Professor Quach has taught most of the mathematics courses offered at a community college level. When teaching advanced math courses such as Calculus and Differential Equations, he regularly uses technology (graphing calculator, computer algebra system, etc.) during the lectures. He worked with other math faculty to update the course outlines and has also given graphing calculator workshops for advanced math students.

Professional Development in the Past Six Years: He has regularly attended CMC3 conferences and workshops providing training in the area of using technologies and teaching mathematics to improve his teaching skills. He always volunteers to conduct peer evaluations every semester.

Proposed Professional Development Activities and Reason for Such Activities: Professor Quach plans to attend workshops and conferences with emphases on teaching mathematics, using technologies, improving student success, etc. He will continue to volunteer to conduct peer evaluations and serve on college committee(s).

Ky, Teck

Your name: Teck Chhon Ky

Your area of expertise:

His area of expertise in mathematics is in Statistics. He received a master's degree in Statistics and a bachelor's degree in Mathematics. His master's Degree in Statistics has afforded him a background in advanced statistics and mathematics. This has afforded him the knowledge to develop effective courses in

statistics and mathematics for community college students. His knowledge will also expand our student's insight and understanding of the role statistics and mathematics have in their careers in business, medicine, social sciences and all their future studies.

How does your position contribute to the success of our program?

As a faculty member, his major contribution to the success of our program is to maintain a high retention rate for students taking Precalculus, Calculus, and Statistics courses. His articulation with high school students during summer school has been enjoyable. He has had the opportunity to work with students from the EXCEL PROGRAM in Precalculus, Calculus, and Statistics. In less than two years, he has experienced some of these students taking MATH 071, MATH 072, MATH 066, MATH 067, and MATH 063.

He would like to assist in expanding our statistics program to meet the demands of our universities, corporations, businesses, and community.

List your professional development activities in the past six years.

In the last six years, he has been a part of the coordinating committee for the ASPIRE Program at EVC. This program focuses on the culturally specific needs of Asian, Pacific Islander and East Indian students. He has assisted in the hiring process of three new faculty members for the department of mathematics and one for the department of psychology.

He has written solution manuals with Professor Soler from De Anza College for one of the elementary textbooks.

Proposed professional development activities and reasons for such activities.

He would like to serve on the hiring committee in our department in the future. He believes that his tenure at Evergreen since 1995 has afforded him the opportunity to know and understand the diversity and complexity of our student population. This understanding has allowed him to develop different teaching styles and integrate cultural differences and similarities that are relational to our students we serve. He believes that his experience will be an asset in hiring the right professor for our students.

He will continue to provide workshops for the Nursing Department students to improve their TEAS (Test of Essential Academic Skills) scores in the quantitative section. The workshop will assist the nursing students with passing the TEAS.

He is a member of the PI MU EPSILON and the AMERICAN STATISTICAL ASSOCIATION. He is an avid reader of these journals and finds useful examples to use in the classroom. This continues to help to make his lectures more interesting in the classroom.

Lombard, Bob

Area of Expertise:

Professor Lombard's expertise lies in developmental mathematics, precalculus algebra and trigonometry, and applied mathematics (with extensive work in differential equations). He used to teach most of his load in developmental mathematics every semester and was considered a lead instructor in MATH 310 (Basic Mathematics) & MATH 311 (Prealgebra). Since AB 705 and the elimination of all developmental courses (except for MATH 013 – Intermediate Algebra), he is now the lead instructor for both MATH 022 (Trigonometry) and MATH 025 (Precalculus Algebra and Trigonometry). He has worked with both full-time and part-time faculty in both courses in the development and assessment of SLO's for the last four years here at EVC. Working on SLO's collaboratively with other department members ties into Strategic Initiative 3: Organizational Transformation. It helps to transform the college's image via (a). Student Access: Completion of Educational Goals, (b) Employee Development, and (c) Transparent Infrastructure. He also possesses a 'fair' amount of knowledge on the subject of differential equations and is an available resource for students who take these courses in our department; over the past four years, there have been instances where students from this course have sought him out in our Math and Science Resource Center (MSRC) to help them with this class. He can easily teach this course upon request or if needed. He taught this course, at the math department's request, in Fall 2017 at Solano College.

How Does His Position Contribute to the Program Success?

Given that most of the course offerings in our department rely on developmental mathematical foundations, it is essential that our math department has some members who have an emphasis on developmental mathematics. Helping other instructors with course information and counseling students on the next mathematics course they should take is just a couple of the important responsibilities which he welcomes every day. Professor Lombard is one of those full-time math faculty members who meet this important need for having expertise in developmental mathematics in our department. He has also been a lead instructor in the development of SLO's and updating of the Precalculus series course outlines, for the last four years.

Professional Development in the Last Six Years:

As part of the district mission statement, student success is the heart of its mission, and the district has aspired to hire the best and brightest faculty to ensure that our students are well prepared after leaving our institution. Since learning is a lifelong endeavor and instructors need to maintain currency in their field, he has chosen to be a member of two professional math organizations: (1) The California Mathematical Council for Community Colleges (CMC3) and (2) The American Mathematical Association of Two-Year Colleges (AMATYC). He usually attends the yearly conference every December in Monterey, California for CMC3 and subscribes to mathematical journals from AMATYC.

Proposed Professional Development Activities and Reason for such Activities:

Professor Lombard loves to interact with students every day; that is why he has chosen teaching as a profession. This is the beginning of his twenty-second year teaching full time at EVC. He plans on teaching here for an additional eight years. But teaching requires a lot of time interacting with Evergreen Valley College Mathematics Program Review Self-Study Document, 2014 Page 60 students, which he obviously immensely enjoys. In the future, he is considering taking a year long sabbatical in the second half of his tenure here at EVC. This would allow him to focus on several aspects of professional development, outside of the classroom, but still focus on helping students inside the classroom.

Knight, Robert W.

Dr. Robert Knight's area of expertise involves the use of technology in the teaching of mathematics. Dr. Knight is an expert in the use of many Learning Management Systems (LMS's) including Canvas and the LMS's created by various textbook publishers like Pearson Education, etc. Dr. Knight has also designed and produced his own LMS called MyClassText which uses free Open Educational Resource textbooks from OpenStax publishing to teach Statistics, thus eliminating the cost of textbooks and publisher-based educational software for his students.

Dr. Knight's contribution to the mathematics program moving forward will be to continue to research and report on the developments in both educational software and hardware as it relates to the teaching of college mathematics.

Cong-Huyen, Laimi

Area of Expertise:

Upper-level mathematics - Calculus and above

How Does Her Position Contribute to Program Success?

In the past six years, Professor Cong-Huyen has taught many different Math courses, from developmental courses to upper-level math courses. As part of our college mission, in order to well prepare our transferred students, in the upper-level courses, she has been helping her students to enhance the learning objectives of each class, and to connect academic learning and community. As a result, she was recognized by University of California, Irvine for dedication to helping students establish a strong personal and academic foundation and having the most significant impact on students' academic performance and successful transfer to the university. Currently, she is the lead instructor for MATH 073, and MATH 079, where she keeps the courses updated and met all CSUs and UCs requirements and conducts the assessments as part of the college accreditation. She also developed MATH 021L - Precalculus Support – to provide just in time instruction for students for additional academic support due to the new Assembly Bill No. 705. Additionally, she is in charge of the AS-T Program in Math since it was first created in 2011 and continues to update the program and coordinates the assessment for all higher level of Math courses to provide quality and efficient program to ensure student success.

Professional Development in the Last Six Years:

Professor Cong-Huyen has participated in the *CMC3* conference almost every year (except the last two years due to the pandemic). There, she attended different workshops, such as “Understanding Black Holes with Elementary Calculus”, “Mathematical Reasoning and Proofs”, and “An Investigation of Elliptic Curves: Symmetries, String-Theoretic E8, and Cryptography”, since her focus area is the high end of lower division math courses. She also participated in several workshops for student services, such as CurriQunet and Canvas. She obtained the certificate for online teaching in order to offer different teaching modalities to students. Professor Cong-Huyen has been a member of the All College Curriculum Committee for almost 10 years. She represents the MSE Division on the committee, where we can help to review, approve, or make changes to the curriculum of the college for a better program for students. She also serves as a chair of the division curriculum committee, where she can assist all disciplines in the division to review the courses and programs.

Vanniasegaram, Sithparran

Areas of Expertise

Professor Vanniasegaram's areas of expertise are mathematics and statistics. In his mathematics and statistics classes, he uses a wide range of teaching strategies (lectures, group work, hands-on demonstrations, etc.) so that students from diverse backgrounds can be successful in his classes. This approach is consistent with the EVC Mission Statement. He tries to maintain high standards in his classes so that his students are well-prepared when they transfer or when they enter the workforce. This approach is also consistent with the District Mission Statement.

How Does His Position Contribute to the Program Success?

Professor Vanniasegaram has made the following "long-term" contributions to the department in the area of statistics: he taught at least two sections of MATH 063 during his first twelve "regular" semesters at EVC (including four during his first semester), has taught MATH 063 every Intersession since 2016, has evaluated three adjunct MATH 063 instructors, and has lead MATH 063 SLO assessment since Fall 2014. He was invited to speak to the entire college about his "closing the loop" MATH 063 SLO work during the Spring 2015 PDD.

Additionally, he helped select the department's current statistics textbook, recently selected five other options for statistics textbooks, updated the MATH 063 course-outline, contributed to a statistics textbook, started a statistics working group, led the department's Statway efforts (writing course outlines, attending training and meetings, etc.), wrote the MATH 063X course outline, and taught the first-ever MATH 063X course offered at EVC.

Aside from statistics, he has helped the department in other ways. He has taught integral calculus and multivariable calculus on a regular basis since Fall 2018, served on the ENLACE Math full-time faculty screening committee, served as the main department meeting minutes taker for eight semesters, has prepared students for the AMATYC (American Mathematical Association of Two-Year Colleges) contest since Spring 2015, evaluated seven non-MATH 063 adjunct instructors, and led MATH 072 SLO assessment since Fall 2016.

He contributed to the department's AB 705 efforts by working on MATH 063X, representing the department at four SJECCD AB 705 meetings/retreats during the 2018 calendar year, participating in AB 705 MATH/AB 705 Taskforce meetings during the Spring 2019 semester, and providing AB 705 email updates approximately every three weeks over three years (49 in total).

Professional Development in the Last Six Years

Because of COVID-19 and the subsequent campus closure, all instructors were forced to teach remotely/online. Fortunately, Professor Vanniasegaram received a lot of training in this area. He took EDIT 022 during Summer 2016 with Professor Nasreen Rahim. This qualifies him to teach online courses at EVC now that the college has returned to face-to-face classes. He also participated in an eight-hour OEI Course Design Rubric workshop during the Fall 2015 semester, learned Zoom teaching strategies from Celso Batalha and Mike Masuda during the Spring 2020 semester, and received additional Canvas training through De Anza College during Spring 2020.

He attended the CMC³ Conference via Zoom last fall and attended the conference in-person during his first four years at EVC. He has participated in three three-day California Acceleration Project workshops (June 2018, June 2019, February 2020) and attended six CCCCO Statistics Institute meetings during Fall 2020, Spring 2021, and Fall 2021 (2 each semester). Finally, he received training in Statway (Summer 2017, Summer 2019), CRM Advise (Fall 2019), Multiple Measures (Fall 2016), 508 Compliance (Fall 2018), and Guided Pathways (Fall 2017).

Proposed Professional Development Activities and Reason for Such Activities

Professor Vanniasegaram will continue to attend the CMC³ Conference in the future. He hopes to learn new teaching strategies from faculty members at other colleges to help improve the retention and success rate in

his classes. He also plans on expanding on his statistics teaching techniques by attending more CCCC Statistics Institutes in the future. Finally, he has never attended the AMATYC Conference and would like to do that at least once in the next six years.

Shanna Erickson

Area of Expertise:

Developmental math and statistics

How Does Her Position Contribute to Program Success?

Since being hired in Fall 2015, Shanna Erickson has taught a variety of math courses (MATH 310, MATH 111, MATH 013, MATH 016, MATH 021, MATH 021L, MATH 022, MATH 063, MATH 063X). She was previously the lead instructor for MATH 111 and is currently the lead instructor for MATH 013. Many of her classes that she teaches are for the ENLACE program, which emphasizes student empowerment and improving student retention, success, and transfer. She also offers an annual pre-statistics math academy during the Summer to help prepare students for MATH 063. In the past, Professor Erickson consistently taught MATH 310, MATH 111, MATH 013, and MATH 063 every semester to support students who have previously struggled with math. With new restrictions on developmental courses stemming from AB 705 requirements, she now teaches MATH 063 and MATH 063X every semester and MATH 013 every Fall. She also teaches MATH 021 in the Spring to provide a STEM path for students in the ENLACE program. She has helped provide extra support to students in teaching MATH 063X Statistics Support sections as well as MATH 021L Precalculus Support. In addition, she helped pilot a new course, MATH 016, designed to provide students with a complete algebra and geometry background in one semester. She was also on the textbook selection committee for this course. She took EDIT 022 in Spring 2019 and started offering both synchronous and asynchronous courses in Spring 2020. Professor Erickson also makes use of OER textbooks, free online homework systems (MyOpenMath), and free graphing calculator software in most of her classes to reduce student financial burden. Professor Erickson uses technology in the classroom to better serve her students (e.g., digital whiteboard notes that can be saved and provided to students as a resource, lecture recordings, online homework). This helps support students both inside and outside the classroom. This use of technology greatly aided her transition to online teaching that became necessary during the recent pandemic (starting Spring 2020). Professor Erickson currently serves as the Math department coordinator (starting Fall 2021). This position includes department organizational tasks, campus liaison, such as class scheduling, textbook ordering, and meeting moderation. She also maintains the department course sequence chart and regularly shares this and other updates with counseling.

Professional Development in the Last Six Years:

Professor Erickson has attended CMC³ three times in the past 6 years, as well as the International Conference on Education (ICOE) in Winter 2019. The International Conference on Education annual conference grants academics and professionals in Education and related fields from around the world to meet and share ideas. The event is cross-disciplinary, allowing attendees to meet and interact with those outside their own levels and disciplines. In 2018, Professor Erickson joined the Safety and Facilities Committee at EVC for a semester. She is also a current member of the AB 705 taskforce and STEM Council and provides department updates to the division, campus, and district as needed. In Spring 2020, she was part of an early transition team at the time that it was becoming increasingly apparent that schools would have to close their campuses during the pandemic. She was able to transition her classes to online-only before most of the district and was able to provide feedback regarding this process. Professor Erickson is currently the advisor for SACNAS (Society for Advancement of Chicanos/Hispanics and Native Americans in Science). This group's annual conference was unfortunately derailed in Spring 2020 because of the state and county mandated lock-down measures. In previous years, the group organized and hosted a conference for local

high school students. At the conference, high school students participate in academic and career workshops, and attend talks from leaders in science from the community. However, in Fall 2020, she was able to organize an event for SACNAS in collaboration with the Stanford Linear Accelerator Center (SLAC). The event, held virtually on October 30, 2020, allowed SACNAS students to tour the lab and hear from some of the scientists and other staff at the facility.

Sylvia Anderson

Area of Expertise

Developmental Math, Statistics, and Calculus.

How position contributes to the program's success

Professor Anderson has taught a wide range of courses offered at EVC. Several of the courses are through the Umoja-AFFIRM program, which focuses on helping students be successful academically and in transferring to a four-year university. She has taught in several modalities, both in-person and online. In addition, she embeds technology, such as, MyMath Lab, MyLab Statistics, Excel, and graphing calculators, into most of her courses. She also conducts review sessions after class to help students prepare for upcoming exams or to review previous coursework.

Professional Development

Professionally, she has attended numerous conferences including: CMC³, JMM (Joint Mathematics Meetings) hosted by AMS and MAA, CAP, T3IC through Texas Instruments, and USCOTS (United States Conference on Teaching Statistics). In addition, she has completed courses related to online learning and instruction.

She will continue to attend conferences, take courses, and conduct review sessions, as an ongoing means of staying updated and aiding students in mathematics instruction.

2. Staff

Pham, Duyen (Bryan)

Mr. Pham is an Instructional Support Program Coordinator. He oversees and coordinates the daily operations of the EVC's Math and Science Resource Center (MSRC), which provides efficient math tutoring and other essential student learning services to ensure student success for all Evergreen Valley College math and science students. He works closely with the Dean of Math, Science, and Engineering division on coordinating the work of MSRC instructional support staff and faculty tutors. He also works with the Campus Academic Skills and Tutoring Instructor on the hiring, mentoring, supervising, and evaluating of all MSRC student tutors. Mr. Pham works to develop SAOs (Service Area Outcomes) for the MSRC and for an overall best tutoring experience for EVC's math and science students.

Nguyen, Nguyet

Ms. Nguyen is a Mathematics Instructional Support Assistant. She provides students and student tutors with guidance, support and tutoring assistance. In the future, she plans to attend workshops offered by the district to improve her skills for working with students.

Marks, Sawanii

Ms. Marks is a Mathematics Instructional Support Assistant. She provides students and student tutors with guidance, support, and tutoring assistance. Her area of expertise is in the interrelationship between the tutors and students. As for her professional developments, she was trained and worked with MyMathLab, and she participated in EdFund's Training Workshop, "Creating Outstanding Customer Service Success."

Vallin, Jorge

Mr. Vallin is a Mathematics Instructional Support Assistant. He provides students and student tutors with guidance, support and tutoring assistance. Jorge is a team player who works closely with the ENLACE instructors. His excellent communication skills with both English and Spanish contribute to being a successful instructional assistant. The bilingual ability provides for challenging math concepts to be explained in the language that students bring with them to EVC. The examples he uses to illustrate the math concepts are culturally relevant and as a result, students are highly engaged.

- **2. In addition to major professional development activities completed by faculty and staff in the past, in particular with regards to students' success, equity, distance education, SLO assessment, guided pathways and/or innovative teaching/learning strategies, are there any additional professional development needs of your department in the future? What are they? Please provide details about a timeline.**

A. Summary of Faculty Activities and How These Activities Contribute to the School Mission: In addition to their regular teaching and committee work, faculty members have engaged in a variety of activities that enhance their teaching and service to the students.

a. Activities that Help Serve the Students: To ensure we offer a quality and efficient program, as described in the Strategic Initiatives of the Program Review Self-Study, all the faculty participated in various training sections of SLO assessments in 2012, and in the past two years, have been actively working in the SLO assessment in each of their classes by submitting an assessment of two or three SLO's of each of their classes. Many faculty members have also actively been participating in various student programs such as ENLACE, EXCEL, ASPIRE, Umoja-AFFIRM and the EVC Honors Program to ensure we meet the school mission of empowering and preparing students from diverse backgrounds to succeed academically. An additional proposed future resource where our mathematics department can contribute to help serve our students better is to offer additional lab hours in the Math and Science Resource Center (MSRC) on the weekends and during intersession.

b. Activities that Enhance Faculty's Knowledge: The quality of a program depends directly on the depth and the scope of the knowledge of its teaching staff. A few full-time and adjunct faculty members in the Department of Mathematics hold doctoral degrees. Many other faculty members have taken additional graduate level courses or have been attending various workshops by @One Institute or elsewhere. Most of the faculty members are also members of professional organizations, such as CMC3, AMATYC, MAA, and AMS. These faculty members participate in professional conferences and subscribe to professional journals to ensure that they have ample knowledge to carry out a quality program.

c. Keeping Abreast with New Technologies and Current Educational Findings: To keep abreast with new technologies and educational findings, math faculty members have been actively participating in many professional conferences such as the ones offered by CMC3, AMATYC, MAA, as well as OnCourse Workshops. The department now offers several online courses, and many classes now have an online component, such as Moodle or MyMathLab. To meet students of diverse backgrounds, a few faculty are very active in participating in conferences and workshops such as SACNAS, STEM, WebAssign, and CurriQunet.

B. Summary of Staff Activities and Their Significance. The Mathematics Instructional Support Assistants are valuable assets to the Evergreen Valley College Mathematics department. In accordance with the district mission and strategic initiatives, the Mathematics Instructional Assistants are doing a great job providing an efficient mathematics tutoring program and essential student learning services to ensure student success. Besides providing tutoring to students, they also supervise, train, support, and evaluate student and volunteer tutors. The Instructional Assistants are also going to developmental math classrooms to serve as Teacher Assistants. Overall, with their focus on supporting a student-centered environment, the Mathematics Instructional Support Assistants are doing a formidable job serving as bridges between math students and mathematics instructors. They play a very important role in student retention and student success in the Evergreen Valley College Mathematics department. Evergreen Valley College Mathematics Program Review Self-Study Document, 2014 Page 63. Some additional activities where staff, math instructional assistants

working in the Math and Science Resource Center (MSRC), could contribute to future staff development is to continue to attend staff development workshops at the college's PPD, as well as attending classes to refresh their mathematical skills.

The department is challenged by the maintenance and improvement (professional development) of full-time faculty, as well as staff and administrative levels to support instructional needs and student support services and keep abreast with recent retirements. Indeed, to sustain current levels of service, the college must commit to a staffing plan, linked to resource allocation, which analyzes human resource needs based upon the size, scope, and changing needs (demographic shifts and gender gaps) of the department: it is then a good idea, for the mathematics department, guided by more extensive student data and by the college and district educational master plans, to assess and analyze the level and diversity of its full-time faculty and staff. The mathematics department and the college could then use the results of that assessment to develop, adopt, fund, and implement long-range staffing that will ensure enough qualified and diverse fulltime faculty, part time faculty and staff (including tutors) to foster an equitable and inclusive environment for all students and assure the quality of the program. Gender gaps in full-time faculty and in STEM courses need to be addressed promptly.

Budget Planning

Part E: Budget Planning

- 1. With your Dean, review the department Fund 10 budget (operational budget) and discuss the adequacy of the budget in meeting the program's needs.**

The 2021-2022 operational budget for conference, travel and training is \$150, but these funds are transferred to Fund 17. The operational budget for equipment is \$0.00.

Mathematics (1700)

GL Account	Description	Budget
10-21-1700-00000-55200	Mathematics : Conference\Travel\Training	\$150.00
10-25-1700-00000-56411	Mathematics : Equipment (\$200 to \$4,999)	\$0.00
17-21-1700-22500-54100	Mathematics : Supplies Instruction	\$350.00

The actual budget is nonexistent, as the \$150 in Fund 10 is transferred to Fund 17 for MSRC needs. Consequently, there is no budget for basic department needs such as lab and testing space, polar graph paper, graphing paper, quality markers, paper refills, staplers in every classroom, a class set of graphing calculators, and tablets or computers for instruction use.

- 2. List all external funds, i.e. fund 17, the department/program receives, and describe their primary use.**

The Fund 17 allocation is \$350 and can only be spent on instructional supplies. If grants or external funding become available, they are posted under this fund.

Technology and Equipment

Part F: Technology and Equipment

- **Review the current department technology and equipment needed and assess program adequacy. List and changes to technology or equipment since the last program review. If changes were made please indicate how the change impacted student success.**

Prior to 2016, the Mathematics Department had at its disposal a computer lab equipped with mathematical and learning software. In 2016, when the department moved from Acacia to MS3, it was initially provided with a computer lab, but this lab was subsequently used for Computer Science classes and became inaccessible to Mathematics students and faculty.

1. There is an immediate need for one or two computer labs for the Mathematics Department. Computer labs are indispensable for providing unique opportunities for instruction and collaboration, promoting equity and preparing students for a technological workplace.
2. The department needs a testing center for online courses with well-trained personnel to run it, especially when we propose to have online/hybrid math courses for the AS-T degree.
3. There is an immediate need for 100 laptops equipped with Maple and Minitab for use in the classroom.
4. There is an immediate need for a class set of graphing calculators (minimum 150).
5. In addition, laptops and tablets are needed for faculty to use as teaching tools in lectures.

Additional Information

Part G: Additional Information

- **Please provide any other pertinent information about the program that these questions did not give you an opportunity to answer.**

Over three years ago (<https://assessment.cccco.edu/ab-705-implementation>), then California Governor Jerry Brown signed AB 705 (a legislative bill) (https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB705). AB 705 has had a significant impact on Math and English departments in community colleges across the state of California. Two months after the bill went into effect, the SJECCD held its first meeting (https://sjeccd.sharepoint.com/leadership-resource-documents/Shared%20Documents/03-14-2018%20Leadership%20Meeting%20Documents/03-14-2018_LeadershipMeetingNotes.pdf) to address AB 705. Since then, the EVC Math Department has worked very hard over the last three and a half years to comply with AB 705. In this part of the program review, the department's AB 705 work and achievements will be discussed.

I. One Year (Two-Semester) Pathways

AB 705 imposes several requirements. One of those requirements is that colleges must "maximize the probability that the student will enter and complete transfer-level coursework in English and Math within a one-year timeframe". In response to this part of the bill, the Math department started discussing possible one-year

pathways during the Spring 2018 semester that would take students from Math courses that were two levels below transfer to and through transfer-level courses.

At the state level, the ASCCC (Academic Senate for California Community Colleges) suggested having non-STEM and STEM pathways (<https://www.ocf.berkeley.edu/~parran/flowchart.pdf>). The first course in each of these two pathways is a “large” algebra course. The ASCCC pathways were two of the initial four options that the department discussed. The other two pathways were Statway (a two-semester statistics course with algebra learned as needed) and the accelerated ENLACE model (MATH 111 and MATH 013 in the first semester, MATH 063 in the second semester).

It was later learned at an ASCCC meeting at San Jose City College that the accelerated ENLACE model would not qualify as a one-year pathway since the model counted as three semesters with regard to AB 705. The department then decided during the Fall 2018 semester not to offer the ASCCC non-STEM pathway (Statpath) so there were two pathways left: (1) Statway and (2) the ASCCC STEM pathway. For the ASCCC STEM pathway, Professor Laimi Cong-Huyen wrote the course outline for MATH 016 (a 7-unit course that combined the fundamentals of MATH 111, MATH 013, and MATH 014).

The administration/department decided to offer five sections of MATH 016 and two sections of MATH 064 during the Fall 2019 semester. The two courses suffered from low enrollment: both MATH 064 sections were canceled and three of the five MATH 016 sections were canceled. Two more sections of MATH 016 were offered during the Spring 2020 semester and both were canceled due to limited enrollment. The District decided during January 2020 to limit the number of pre-transfer-level courses offered so MATH 016 and MATH 064/MATH 065 were discontinued.

II. Co-Requisite Courses

The department’s first curriculum strategy in response to AB 705 was limited to two-semester pathways and did not involve co-requisite courses. During the Spring 2019 semester, the majority of the California community college Math departments offered co-requisite courses. That semester, the Math department decided to follow suit and create and offer co-requisite Math courses. Professor Parran Vanniasegaram wrote the course outline for MATH 063X (the co-requisite for MATH 063) and Professor Laimi Cong-Huyen wrote the course outline for MATH 021L (the co-requisite for MATH 021) during Summer 2019.

It is stated in the AB 705 bill that “a community college or district may require students to enroll in additional concurrent support..... during the same semester that they take a transfer-level English or mathematics course, but only if it is determined that the support will increase their likelihood of passing the transfer-level English or mathematics course.” The Math department decided not to require *any* student to take the co-requisite courses.

The Math department started offering MATH 063X during the Spring 2020 semester and MATH 021L during the Fall 2020 semester. Over 160 students enrolled in MATH 021L and over 120 students enrolled in MATH 063X during the Fall 2020 semester. Enrollment dropped for the two co-requisite courses during the Spring 2021 semester: 125 students signed up for MATH 021L and 85 students signed up for MATH 063X.

III. Placement

Another part of the AB 705 bill states that community colleges cannot require “students to enroll in remedial English or mathematics coursework that lengthens their time to complete a degree unless placement research that includes consideration of high school grade point average and coursework shows that those students are highly unlikely to succeed in transfer-level coursework in English and mathematics.” No such research was produced so developmental Math prerequisites were eliminated. Thus, any student can enroll into any of the entry-level transfer-level Math courses: MATH 022, MATH 061, MATH 063, MATH 021, MATH 022, and MATH 025. (Course outlines were changed by the lead instructors to incorporate this new placement rule.)

IV. Bootcamps/Supplemental Instruction

With fewer restrictions, less-prepared students are eligible to take the entry-level, transfer-level Math courses and some of them can use additional support. As mentioned in a previous section, co-requisite courses were developed with these students in mind. Additionally, short courses *before* the term were offered. Before AB 705 was enacted, ENLACE offered boot camps (taught by Professor Erickson) for students to review prerequisite material before taking their math course. With AB 705 in place, Professor Teck Ky started offering additional boot camps before the Fall 2018 semester. The boot camps were offered for a few semesters but because of limited funding, we stopped offering them in 2020. (As mentioned earlier in Part A of the Program Review, the department is hoping that the college will offer funding to restart the boot camps.)

In the past, embedded tutoring was offered at EVC in several classes. After AB 705, embedded tutoring transformed into supplemental instruction. Starting in Spring 2019, several MATH 063 and MATH 021 instructors incorporated supplemental instruction into their classes. Professors Sylvia Anderson and Vanniasegaram gathered information from these instructors about how they were using supplemental instruction and reported their findings to Professor William Nguyen. Professor Nguyen has led the supplemental instruction effort across campus.

V. Decrease in Developmental Math Sections

Since students could enroll directly into transfer-level courses, the department was forced to reduce the number of developmental Math courses it offered. During the Fall 2017 semester (<https://www.evc.edu/StudentAffairs/Documents/2017-fall-schedule.pdf>), the department offered a total of 57 developmental Math sections:

- seven sections of MATH 310 [three levels below transfer],
- eight sections of MATH 311 [three levels below transfer],
- sixteen sections of MATH 111 [two levels below transfer],
- twenty-two sections of MATH 013 [one level below transfer],
- and four sections of MATH 014 [one level below transfer].

The department deactivated MATH 310 during the Spring 2019 semester, but continued to offer MATH 311, MATH 111, MATH 013, and MATH 014. In spite of the fact that *all* students could enroll directly into transfer-level Math courses, all the developmental sections were filled during the Spring 2019 semester.

As mentioned earlier, the District expressed a preference in early 2020 that all stand-alone developmental Math sections be eliminated. In response to this request, MATH 311 was deactivated, MATH 111 and MATH 014 were no longer offered, and only four sections of MATH 013 were offered during Fall 2020. For its

efforts in reducing the number of stand-alone developmental sections (from 57 to 4 in a three-year time period), EVC was named “a Strong Implementer Math College” in Page 15 of this California Acceleration Project (CAP) report (https://accelerationproject.org/Portals/0/Documents/Still_Getting_There_Final.pdf).

Finally, in Spring 2022 it was decided that EVC would no longer offer any MATH 013 sections starting Summer 2022.

The Math department enrollment has declined significantly since 2019 (see Part A). While some of this decline can be attributed to the pandemic, part of the decline may also be due to the decrease in developmental Math sections.

VI. Communication

The aforementioned changes had to be communicated from the Math department to the rest of the college and to the general public. Professor Vanniasegaram started this communication in Spring 2018 when he discussed AB 705 and possible two-semester pathways at a Division meeting and at PDD. Professor Shanna Erickson later communicated the department’s plans at a SJECCD Board meeting two months later.

She also (along with other faculty members) presented the department’s AB 705 related plans at various Counseling Department meetings. Professor Vanniasegaram updated the District on the department’s work during two AB 705 retreats in 2018 as well as key EVC AB 705 employees during the Spring 2019 AB 705 Task Force Meetings. At the Fall 2019 PDD, several department members provided updates to the campus community.

To help students and counselors better understand the course changes, the department has had many discussions regarding their flow chart. Professor Erickson digitized the flow chart in Spring 2018 and has made several updates to it based on the department’s discussions.

VII. Professional Development

There are 114 colleges in the California Community College system and the AB 705 data and experiences from the colleges were shared at different statewide and Bay Area meetings. Faculty members from the department attended CAP workshops during June 2018, June 2019, and February 2020. They also attended the CMC³ Conferences in December 2018 and December 2019, the ASCCC Curriculum Regional Meeting at Mission College in March 2019, and The Research and Planning Group for California Community Colleges meeting at De Anza College in April 2019.

As written earlier, new students are now entering the entry-level, transfer-level Math courses because of the AB 705 changes. At the CAP meetings, various teaching strategies and materials were shared to reach this group. During the Fall 2020, Spring 2021, and Fall 2021 semesters, the CCCCO (California Community Colleges Chancellor’s Office) offered multiple Statistics Institute workshops. Professor Vanniasegaram attended seven of these workshops and shared the workshop materials with the department via email.

Future Needs and Resource Allocation Request

Based on the areas noted below, please indicate any unmet needs for the program to maintain or build over the next six years. Please provide rationale on how the request connects back to SLO/PLO assessment, strategic initiatives or student success. If no additional requests are needed in any of the areas, put N/A.

1. Faculty Request

Ongoing Budget Needs

More staff in the MSRC – Due to high demand and suggestions from students using the lab, evening and weekend tutoring hours for math and science are needed. In addition, the MSRC needs to provide tutoring services to math and science students during winter intersessions.

One-Time Expenditure

One full-time faculty position. Since the last program review, 3 full time faculty have retired or transferred, and we only rehired 2 new faculty. Our ratio of full-time to part-time faculty is too low, and we will have even more sections to fill due to reduced class sizes.

Total Expenses (Staffing and Faculty Requests include Salary and Benefits)

200000.000

Request linked to SLO/PLO

PLO#1,2,3

Total Cost

200000.000

Strategic Initiatives (student centered, organizational transformation, community engagement)

Yes

Improving Student success rates

Yes

Achievement of program set standard for student success

Yes

2. Facilities

Ongoing Budget Needs

Hardware/Software updates – Software and computers being used for in-class activities will need to be updated for compatibility with current operating system(s).

One-Time Expenditure

Two rooms with computers designated for math classes – The math department offers advanced math courses (Calculus, Linear Algebra, and Differential Equations) and Statistics which students use softwares such as Excel, Maple, Matlab, Minitab, etc. for in-class activities. The department needs a testing center for online courses with well-trained personnel to run it, especially when we propose to have online/hybrid math courses for the AS-T degree.

Request linked to SLO/PLO

PLO #1,2,3

Total Cost

Strategic Initiatives (student centered, organizational transformation, community engagement)

Yes

Improving Student success rates

Yes

Achievement of program set standard for student success

Yes

3. Technology

Ongoing Budget Needs

Hardware/Software updates – Software and computers being used for in-class activities will need to be updated for compatibility with current operating system(s).

One-Time Expenditure

Ongoing Budget Needs: Hardware/Software updates – Software and computers being used for in-class activities will need to be updated for compatibility with current operating system(s). One-time Expenditure: • The department needs a testing center for online courses with well trained personal to run it, especially when we propose to have online/hybrid math courses for the AS-T degree. • Laptops/tablets for faculty to use as teaching tools for lectures in classes – Students find such devices more beneficial for them than traditional teaching tools such as chalkboard or whiteboard. Faculty can save their lecture notes and provide them to their students or refer to them at a later time during lectures. • Graphing calculators and math softwares such as Matlab, Maple, MathType, Minitab, etc. – These are needed and/or required for our advanced math courses and Statistics. • Bluetooth-enabled computers and projectors – Bluetooth capability will enable faculty to move freely around the room to allow students to input their work on the projectors wirelessly.

Request linked to SLO/PLO #

PLO #1,2,3

Total Cost**Strategic Initiatives (student centered, organizational transformation, community engagement)**

Yes

Improving Student success rates

Yes

Achievement of program set standard for student success

Yes

4. **Equipment/Supplies****Ongoing Budget Needs**

Hardware/Software updates – Software and computers being used for in-class activities will need to be updated for compatibility with current operating system(s).

One-Time Expenditure

• Twenty 2-in-1 laptops/tablets for faculty to use as teaching tools - Students find such devices more beneficial for them than traditional teaching tools such as chalkboard or whiteboard. Faculty can save their lecture notes and provide them to their students and/or refer to them at a later time during lectures. • Three class sets of graphing calculators (150 graphing calculators) and two class sets of laptops (100 laptops) with installed math softwares such as Excel, Maple, Matlab, MathType, Minitab, etc. – Since the math department does not currently have classrooms with computers designated for some of its advanced math courses, math faculty need these portable devices to take with them to classes for their students to use during in-class activities.

Request linked to SLO/PLO #

PLO #1,2,3

Total Cost**Strategic Initiatives (student centered, organizational transformation, community engagement)**

Yes

Improving Student success rates

Yes

Achievement of program set standard for student success

Yes

Attach Files

Attached File

Math 013 SLO.pdf.docx (/Form/Module/_DownloadFile/1469/41960?fileId=52)

Mathematics 022.docx (/Form/Module/_DownloadFile/1469/41960?fileId=53)

Mathematics 025.docx (/Form/Module/_DownloadFile/1469/41960?fileId=54)

Mathematics 052.docx (/Form/Module/_DownloadFile/1469/41960?fileId=55)

Mathematics 061.docx (/Form/Module/_DownloadFile/1469/41960?fileId=56)

Mathematics 073.docx (/Form/Module/_DownloadFile/1469/41960?fileId=57)

Mathematics 111.docx (/Form/Module/_DownloadFile/1469/41960?fileId=58)

Program Review Math 61.pdf (/Form/Module/_DownloadFile/1469/41960?fileId=59)

Math 78.docx (/Form/Module/_DownloadFile/1469/41960?fileId=60)

Mathematics 14.docx (/Form/Module/_DownloadFile/1469/41960?fileId=61)

Math 71.docx (/Form/Module/_DownloadFile/1469/41960?fileId=62)

Math 062.docx (/Form/Module/_DownloadFile/1469/41960?fileId=63)

Math 063.docx (/Form/Module/_DownloadFile/1469/41960?fileId=64)

Program Review Minutes Math Department.zip (/Form/Module/_DownloadFile/1469/41960?fileId=65)

Program Review Division Meeting Minutes.zip (/Form/Module/_DownloadFile/1469/41960?fileId=68)

Math 066 SLO.pdf (/Form/Module/_DownloadFile/1469/41960?fileId=69)

Math 067 SLO.pdf (/Form/Module/_DownloadFile/1469/41960?fileId=70)

Math 066B SLO.pdf (/Form/Module/_DownloadFile/1469/41960?fileId=71)

Math 067B SLO.pdf (/Form/Module/_DownloadFile/1469/41960?fileId=72)

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