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 **College of Alameda**

2022-23 Program Review – Mathematics

**Lead Author:**

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| **Vanson Nguyen** |

**Program Overview**

Provide your program’s mission statement. If your program does not have a mission statement, what is your timeline for creating a mission statement?

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| The COA Mathematics department strives to inspire learners to build mathematical skills, make connections [between mathematics and the world], and contribute to society. |

List your program faculty and/or staff

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| Khalilah Beal-UribeVanson NguyenRichard KaeserSue BroxholmPhilip BuiMike GhiselliEmmanuel HerreraFarzan RiazatiChad-Eric MontgomeryChristopher Wu |

Describe your current utilization of facilities, including labs and other space

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| Classrooms, offices, computer labs, fab lab, |

List your program goals from your most recent Program Review or APU. Then, provide an update on the status of the goal. Has your program achieved the goal? Have any of your goals been revised or any still in progress? Lastly, make sure to discuss which College or District goal your program goal aligns to.

If no program goals exist or if this is your first program review, work to create 2-3 goals and align them with a College or District goal.

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| **Program Goal** | Revisit Mission Statement and (Program) SLO’s |
| Status: In-Progress or Complete?  | In progress |
| Which college or district goal is aligned with your program goal? | Advance COA teaching and learningStrengthen data-driven/informed decision making |

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| **Program Goal** | Develop departmental programming for math majors |
| Status: In-Progress or Complete?  | In progress |
| Which college or district goal is aligned with your program goal? | Advance COA teaching and learningIncrease access to college programs/coursework through collaboration with other PCCD colleges in redesigning college schedules and offerings |

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| **Program Goal** | Engage department faculty through renewed training and collaboration for online teaching, teaching evaluations and an internal assessment tool. |
| Status: In-Progress or Complete?  | In progress |
| Which college or district goal is aligned with your program goal? | Advance COA teaching and learningIncrease community & educational partnerships |

**Enrollment Trends**



**[Enrollment Trends Dashboard link](https://app.powerbi.com/view?r=eyJrIjoiNWJlOWZmYTEtNTY0MC00MDhkLWE5OTAtYmJjZjIxNzJiNWViIiwidCI6ImVlYTE2YTE2LTQ4YWYtNDc3Yi05MTEzLTA1YjFjMDExMjNmZiIsImMiOjZ9&pageName=ReportSection86d6f65e2fb41a73da4d)**

Discuss enrollment trends over the past three years

*For additional analysis, click on the Enrollment Trends Dashboard, set the filters to Alameda and your discipline*

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| Enrollment has dropped significantly over the past 3 years. We suspect this is due to the pandemic and other social factors. The department has worked to diversify courses for students to enroll which include offering new courses like Math 15 and 11, offerings courses that are taken “together” in consecutive 8-week courses during the regular semester like 3E and 3F, offering intersession courses, and scheduling late-start courses before students can enroll. |

Describe effective and innovative teaching strategies used by faculty to increase student learning and engagement.

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| The department regularly engages in Professional Development activities ranging from Distance education, mathematics education and equity. Rich Kaeser is DE coordinator for the college and he and Khalilah Beal-Uribe are POCR certified. |

How does the discipline, department, or program maintain the integrity and consistency of academic standards with all methods of delivery, including face to face, hybrid, and Distance Education courses?

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| The department is proactively engaging in professional development. Khalilah and Rich have delved deep into Distance Education professional development. Both are POCR certified and Rich is the DE coordinator for the campus. Whether through evaluation, informal conversations or FLEX day, faculty are regularly engaged in improving all methods of delivery.  |

**Curriculum**

Have all your course outlines of record in CurriQunet been reviewed within the past three years?



**https://peralta.curricunet.com/**

X Yes ☐ No, please explain:

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Please list any planned changes from the current semester forward for curriculum (courses, degrees, and/or certificates) and the rationale for those changes (e.g., labor market data, advisory committee recommendations, transfer institution changes, industry trends, state-wide transfer model curriculum).

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| Will update Math 1 to reflect CID descriptor Math 151. Will work towards direct articulation of Math 16A with UC Berkeley.  |

How is your program meeting the needs of students, and/or articulation with four-year institutions?

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| Keeping up to date through the articulation officer and collaborating with other local CSU’s on grant projects. |

**Student Learning Outcomes Assessment**

List your Student Learning Outcomes

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| **Math 13 – Introduction to Statistics**1. Interpret measures of central tendency, variation, and position of data sets
2. Compute and interpret probabilities using normal and t-distributions.
3. Analyze hypothesis tests.
 | **Math 16A**1. Develop problem solving abilities: Synthesize data, translate words into math language, and construct an abstract model that describes the problem
2. Analyze information, and create a graph that is correctly titled and labeled, appropriately designed, and accurately emphasizes the most important data content (Graphing)
3. Write and manipulate complex algebraic expressions and general functions, and be able to differentiate and integrate algebraic and transcendental functions. (Compute, simplify, and solve)
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| **Math 225 – Math for Technicians\***1. Manipulate algebraic expressions to simplify them.
2. Develop problem solving abilities: Synthesize data, translate words into math language, and construct an abstract model that describes the problem.
3. Given data, analyze information, and create a graph that is correctly titled and labeled, appropriately designed, and accurately emphasizes the most important data content.
 | **Math 203 – Intermediate Algebra** 1. Analyze real world applications.
2. Solve quadratic, radical, rational, and absolute value equations.
3. Represent linear relationships between two variables graphically, numerically, symbolically, and verbally.
4. Apply Logarithmic and Exponent Rules to simplify expressions.
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| **Math 3A – Calculus I**1. Evaluate derivatives and integrals using the Chain Rule
2. Recognize relationship between derivatives and integrals through the Fundamental Theorem of Calculus
3. Analyze rates of change as derivatives
 | **Math 3B – Calculus II**1. Use integration by parts and partial fraction decomposition
2. Analyze real world applications using Taylor polynomials.
3. Formulate integrals for lengths of curves, areas, and volumes.
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| **Math 3C – Calculus III** 1. Develop problem solving abilities: Synthesize data, translate words into math language, and construct an abstract model that describes the problem.
2. Given data, students will analyze information, and create a graph that is correctly titled and labeled, appropriately designed, and accurately emphasizes the most important data content.
3. Students will be to write and manipulate complex algebraic expressions and general functions and integrate algebraic and transcendental functions of several variables.
 | **Math 3E – Linear Algebra**1. Solve systems of equations using various methods appropriate to lower division linear algebra.
2. Calculate the dimensions of subspaces associated with linear transformations.
3. Analyze real world applications involving eigenvectors and eigenvalues.
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| **Math 3F – Differential Equations\**** Phase plane analysis, Trajectories (linear systems at the end of course)
* Solving first-order separable equations and second-order linear homogeneous constant coefficient
* Equilibrium solutions and stability
 | **Math 50- Trigonometry**1. Compute values of the six basic trigonometric functions
2. Graph and apply transformations to the six basic trigonometric functions
3. Analyze real world applications
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| **Math 1 – Pre-calculus**1. Apply transformations to the graphs of functions and relations;
2. Recognize the relationship between functions and their inverses graphically and algebraically;
3. Analyze real world applications
 | **Math 15 - Math for Liberal Arts\*\***1. Compute, with sophisticated formulas, such quantities as interest payments for amortized loans.
2. Given data, students will analyze information, and create a graph that is correctly titled and labeled, appropriately designed, and accurately emphasizes the most important data content. (Graphing)
3. Students will be able to write and manipulate complex algebraic expressions and general functions, and be able to differentiate and integrate algebraic and transcendental functions. (Compute, Simplify, and Solve)
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| **Math 11 – Discrete Mathematics\*\***1. Develop problem-solving abilities: Synthesize data, translate words into math language, and construct an abstract model that describes the problem.
2. Given data, students will analyze information, and create a graph that is correctly titled and labeled, appropriately designed, and accurately emphasizes the most important data content. (Graphing)
3. Students will be to write and manipulate complex algebraic expressions and general functions, and be able to differentiate and integrate algebraic and transcendental functions. (Compute, Simplify, and Solve)
 | **Math 213 (same as Math 13)****Math 215 (same as Math 1)****Math 216 (same as Math 50)** |

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Please provide a high-level summary and your program’s interpretation of your SLO findings over the past year.

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| Many students understand the main concepts. There are minor misunderstandings in addition to students not completing assessments receiving scores of 0. When students had more than 1 attempt, they generally scored higher on assessments. Also, students performed better on assessments where there were multiple types of assessments like self-assessments, video assessments, and group work as well as having multiple iterations of doing new assessments like discussion forums and self-assessments. |

What were the most important things your department learned from assessment? Did implementation of your action plans result in better student learning?

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| Have students write reflections, consider reordering concepts where most difficult are at the end of the term, improve content to highlight specific topics, follow up with students and keep up with their responses, state learning objectives and outcomes, write concepts next to each math step, Encourage students to try all questions, and more practice during class |

Have you assessed your program learning outcomes (PLOs) within the past few years? How have your assessments informed improvements/changes to your program. If you have not assessed your PLOs, explain the plan to assess and the expected timeline.

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| Beginning the next SLO 3-year cycle in Fall 2023, the department will assess PLO’s. The department will use a combination of assessments for courses as well as non-course specific assessments.  |

College of Alameda Institutional Learning Outcomes (ILOs) were created to guide educational programs and services. They include:

* **Problem Solving:** Solve problems and make decisions in life and work using critical thinking, quantitative reasoning, community resources, and civil engagement.
* **Communication and Technology:** Use technology and written and oral communication to discover, develop, and relate critical ideas in multiple environments.
* **Creativity:** Exhibit aesthetic reflection to promote, participate and contribute to human development, expression, creativity, and curiosity.
* **Diversity:** Engage in respectful interpersonal communications, acknowledging ideas and values of diverse individuals that represent different ethnic, racial, cultural, and gender expressions.
* **Civic Responsibility:** Accept personal, civic, social and environmental responsibility in order to become a productive local and global community member.

How does your program participate in assessing the Institutional Learning Outcomes (ILOs)? If your program has not participated, how will you plan to incorporate these outcomes within your program?

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| The department has not participated in ILO’s yet and will wait for leadership to initiate assessments. |

**Course Completion**

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| College | Academic Year | Subject  | Total Graded | Course Completion | Course Completion Rate |
| Alameda | 2022 | MATH | 1686 | 1061 | 63% |
| Alameda | 2021 | MATH | 2469 | 1722 | 70% |
| Alameda | 2020 | MATH | 2553 | 1865 | 73% |
| Alameda | 2019 | MATH | 3256 | 2120 | 65% |
| Alameda | 2018 | MATH | 3130 | 2010 | 64% |

Consider your course completion rates over the past three to five years (% of student who earned a grade of "C" or better).

[**Course Completion Dashboard link**](https://app.powerbi.com/view?r=eyJrIjoiNjc2MDhiNTEtNTJhZi00MDM0LTk5NDItNTRiY2EzMGI1NTZiIiwidCI6ImVlYTE2YTE2LTQ4YWYtNDc3Yi05MTEzLTA1YjFjMDExMjNmZiIsImMiOjZ9&pageName=ReportSection86d6f65e2fb41a73da4d)

How does the course completion rate for your program or discipline compared to your college's Institution-Set Standard for course completion of **67%**?

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| The department hovers just above or just below the Institution-Set Standard. |

Are there substantial differences in course completion rates between face to face and Distance Education/hybrid courses? If so, how does the discipline, department, or program address this?

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| The completion rates for face-to-face and DE/hybrid courses are almost identical. However, the retention rates are 6 percentage points higher (86%) in face to face vs DE (80%). There is not a substantial difference.  |

If your program offers dual enrollment courses, examine the data, and discuss the course completion rates compared to the overall program rate.

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| Dual enrollment completion rates are significantly lower than overall program rate, up to 18 percentage points. When adjusted by removing MW and EW grades, dual enrollment with CCAP agreements are right at the same completion rate as overall program rate while the dual enrollment without CCAP agreements are near 100%. |

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| College | Academic Year | Subject | Total Graded | Total Retained | Course Retention Rate |
| Alameda | 2021-2022 | MATH | 1686 | 1295 | 77% |
| Alameda | 2020-2021 | MATH | 2469 | 1994 | 81% |
| Alameda | 2019-2020 | MATH | 2553 | 2127 | 83% |
| Alameda | 2018-2019 | MATH | 3256 | 2675 | 82% |
| Alameda | 2017-2018 | MATH | 3130 | 2606 | 83% |

On average the course retention rate (number of students are retained in the course) for College of Alameda has been **85%** for the past three years. Examine the course retention rates for your program over the last three years. How does your program or discipline course retention rates compare to the college?

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| The department’s course retention rate consistently hovers closely below the institutional average. |

College of Alameda continues to focus on access, equity, and success. The goal is to create an inclusive environment where all students can thrive and meet their education and career goals.

To address equity gaps and work towards achieving equity in educational outcomes, examine your program data for evidence of disproportionate impact (DI). Using the percentage point gap method to identify DI, subgroups whose course completion rate falls more than -3 percentage points below the All Students success rate are highlighted red. The Margin of Error value (MOE) is used to determine the presence of DI using the Point Gap Method. Values lower than the corresponding MOE are reflective of disproportionate impact (i.e., pink highlighted cells). Groups with 10 students or less are excluded from the analysis.

Note: The table reflected use 2021-22 course data to calculate DI.

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| **College** | **Subject** | **Target Population** | **Census Enrollment** | **Success Rate** | **PPG Index** | **MOE**  | **DI Identified** |
| Alameda | MATH | All Students | 1686 | 62.9 |   |   |   |
| Alameda | MATH | Asian | 496 | 80.6 | 17.7 | -4.3 | FALSE |
| Alameda | MATH | Black / African American | 258 | 54.3 | -8.7 | -5.9 | TRUE |
| Alameda | MATH | Decline to State / Unknown | 73 | 79.5 | 16.5 | -11.1 | FALSE |
| Alameda | MATH | DSPS/SAS | 161 | 58.4 | -4.5 | -7.5 | FALSE |
| Alameda | MATH | Female | 806 | 61.8 | -1.1 | -3.3 | FALSE |
| Alameda | MATH | First Generation | 837 | 57.1 | -5.8 | -3.3 | TRUE |
| Alameda | MATH | Hispanic / Latino | 503 | 49.1 | -13.8 | -4.2 | TRUE |
| Alameda | MATH | Male | 807 | 62.6 | -0.4 | -3.3 | FALSE |
| Alameda | MATH | Two or More | 122 | 59.0 | -3.9 | -8.6 | FALSE |
| Alameda | MATH | Unknown / NR | 49 | 71.4 | 8.5 | -13.5 | FALSE |
| Alameda | MATH | White | 250 | 66.0 | 3.1 | -6.0 | FALSE |

What can your discipline, department, or program do to improve course completion for disproportionate impacted groups?

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| The department has begun collaborating with learning communities like Umoja, ACCESO and Salaam. Although learning communities are 1-class math offerings, it’s a start and step in the right direction. The department has always collaborated with resources like EOPS, LRC and SAS and will continue to engage with campus resources to bridge student referrals. Since the college received a grant a few years ago around Zero-Textbook Cost, the department offers courses overwhelmingly at zero cost. The department regularly engages in Professional Development activities ranging from Distance education, mathematics education and equity. Rich Kaeser is DE coordinator for the college and he and Khalilah Beal-Uribe are POCR certified and have been working with faculty in the department to improve their Canvas shells and online teaching. |

**Degrees & Certificates Conferred**

Does your program offer any degree/certificate programs? If your program does not, skip this section and continue to **Engagement**

Since the last program review, what has the discipline, department, or program done to improve the number of degrees and certificates awarded?

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| Over the past few years, the department has increased the quantity of sections of Math 3B and up. Additionally, innovative scheduling has been utilized including offering Math 3E and 3F as consecutive 8 week courses; many CoA math majors need to take both for their bachelor’s degrees. Also, the math department will be offering Math 11 for the first time in a long time in 2023 which will count as an elective locally, but many CoA math majors need the course for their upper division studies.  |

For more information on awards: [**Degrees & Certificates Dashboard link**](https://app.powerbi.com/view?r=eyJrIjoiZjU2M2M5MzItOTcwZi00Y2U1LWJmODUtYTc0YjlhZGI2ZDhjIiwidCI6ImVlYTE2YTE2LTQ4YWYtNDc3Yi05MTEzLTA1YjFjMDExMjNmZiIsImMiOjZ9&pageName=ReportSectionde32556e136b0a8caccd)

Increasing the number of students who complete a certificate or degree is a shared goal across CoA’s Ed Master Plan Goals, PCCD Goals, the Chancellor’s Office Vision for Success, the Student-Centered Funding Formula, and Guided Pathways. What is planned for the next 3 years to increase the number of certificates and degrees awarded?

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| Moving forward, the department looks to engage the math majors directly. This includes working towards a Math/STEM club, taking students on field trips, advising math majors similar to how universities operate, and provide graduation attire. Also, the department collaborates with other departments to align scheduling in the spirit of guided pathways.  |

**Engagement**

Discuss how faculty and staff have engaged in institutional efforts such as committees, presentations, and departmental activities. Please list the committees that full-time faculty participate in.

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| The mathematics department is heavily engaged on campus. Khalilah Beal-Uribe has been a SLO coordinator, POCR certified, on the Academic Senate, IEC, part of a district grant.Rich Kaeser is the current DE coordinator, POCR certified, Union Representative for the campus, on the Academic Senate, budget committee and curriculum committee.Vanson Nguyen is evaluation coordinator, part of a district grant and mission statement task committee.  |

Discuss how faculty and staff have engaged in community activities, partnerships and/or collaborations.

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| The district grants that faculty are working on includes campuses from all colleges in the district, CSU East Bay, San Francisco State and a few other local community colleges.  |

Discuss how adjunct faculty members are included in departmental training, discussions, and decision-making.

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| Adjunct faculty are invited to all departmental activities including department meetings, department luncheons, SLO committee, grant participation and professional development opportunities. Soon, adjunct faculty will be invited to conduct faculty evaluations.  |

**Prioritized Resource Requests Summary**

In the boxes below, please add resource requests for your program. If there are no resource requested, leave the boxes blank.

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| **Resource Category** | **Description/Justification** | **Total Estimated Cost** |
| Personnel: Classified Staff |  |  |
| Personnel: Student Worker |  |  |
| Personnel: Part Time Faculty |  |  |
| Personnel: Full Time Faculty  | Need replacement for recently retired Professor Deidre Baker. | $100,000 |

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| **Resource Category** | **Description/Justification** | **Total Estimated Cost** |
| Professional Development: Department wide PD needed |  |  |
| Professional Development: Personal/Individual PD needed |  |  |
| Supplies: Software |  |  |
| Supplies: Books, Magazines, and/or Periodicals |  |  |
| Supplies: Instructional Supplies |  |  |
| Supplies: Non-Instructional Supplies |  |  |
| Supplies: Library Collections |  |  |
| Technology & Equipment |  |  |
| Library: Library materials/collections |  |  |
| Facilities: Classrooms/Labs |  |  |
| Facilities: Offices |  |  |
| Other |  |  |