

ANNUAL PROGRAM REPORT

College	Science
Department	Mathematics
Program	BS and MS
Reporting for Academic Year	2019-20
Last 5-Year Review	2017-18
Next 5-Year Review	2022-23
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I. SELF-STUDY

A. Five-Year Review Planning Goals

- Improve, enhance and modernize the curriculum in support of student success
- Support faculty professional work in alignment with department priorities, goals and student engagement
- Work collaboratively across the university and within the College of Science in support of student success

B. Progress Toward Five-Year Review Planning Goals

Because of the extraordinary circumstances of the past year, in this report the Department of Mathematics will highlight its work supporting students through the pandemic, move to remote instruction, civil unrest, and the fight for justice in our nation.

As was stated in our message to faculty and students at the start of the fall term, before anything else, we must acknowledge how difficult the past months have been for us, our families, our students, our community, our nation, and the world. The COVID-19 pandemic is creating havoc and uncertainty while at the same time, the powerful Black Lives Matter movement is inspiring and challenging us to rethink and re-evaluate the way we approach our obligations and opportunities as educators.

In this report, we take the opportunity to share with you some concrete actions we in the Department of Mathematics have taken and the work we will continue to do to operationalize our commitment to **Access, Equity, Flexibility, Community**. This is hard work, but it is important and ongoing work which we tackle together.

We are committed to actively creating inclusive, anti-racist learning opportunities for Cal State East Bay students. This work has started and will continue through the following explicit actions and practices:

- engaging in difficult and uncomfortable conversations about race and privilege and how we can empathize and connect with our students who may perceive us and our discipline as unwelcoming and inaccessible.
- reading about the policies and practices that form the foundation of our educational system such as Limitless Mind by Jo Boaler and How to be an Anti-racist by Ibram X. Kendi.
- developing shared resources for our entry level courses that speak to our commitment by:
 - incorporating more supportive and inclusive syllabus language.
 - re-considering our assessment methods to allow for multiple ways for students to demonstrate their understanding.
 - And, finally, by sharing this information and our priorities and expectations with all math teachers at CSU East Bay.

Appendix B includes a matrix of highlights of faculty achievements over the past year (or so) in the areas of Instructional Innovations, Publications and Works in Progress, Grants and Funding, Presentations and Dissemination, and Leadership/Service in support of department goals. A close look will reveal a department working individually and as a team towards supporting inclusive, innovative, and inspiring learning opportunities for all students. To repeat, our department is committed to and focused on **Access, Equity, Flexibility, Community**. The activities outlined in Appendix B demonstrate progress towards our Five-Year Review Planning Goals. Activities in that matrix provide evidence for each of the subgoals shown below.

- Improve, enhance and modernize the curriculum in support of student success
 - Modeling Best Practices: We are using recognized promising practices aligned with common core strategies of problem solving, creative and critical thinking, and communication skills. We use high tech and no tech approaches such as smart boards and whiteboards, laptops and tabletops. Students are asked to collaborate and to facilitate collaborations to present and evaluate to use critical thinking and to elicit critical thinking across our curriculum. Students are also given the opportunity to work on in depth projects that extend and deepen their understanding of mathematics. With the abrupt move to remote instruction, all of these approaches continued to be practiced in a remote setting. This fall, we have established a departmental policy that all classes meet synchronously during remote learning. Our faculty came together to share strategies using zoom, online whiteboards, jamboards, google docs, breakout rooms, survey tools, and more to keep our students engaged, active, and community focused.
 - Support for our majors: We are providing more opportunities for students to engage in research and/or projects beyond the classroom or standard curriculum. We are looking towards further modernizing our offerings and stronger recruitment to those focused on careers that use math to solve problems in our community and our society. The potential for a course sequence with a computational focus and problems related to data science will be considered, with accompanying resource implications. We will also work on ways to recruit and strengthen our graduate program, whose enrollment has been on a negative trajectory.
 - Facilitate progression: Two key areas of focus are: (1) Pathways to the teacher credential program through scholarships and our accredited Single Subject Waiver program and (2) Pathways to completion of B4/GE with support for those identified as less prepared than their peers. We have substantial external funding supporting both of these efforts. For teacher pathways, the NOYCE scholarship highlighted in Appendix C and for the B4/GE pathways, both the NSF SEMINAL and Learning Labs Bay Area Math Collaborative (BAM-C) support the B4/GE innovation.
 - Value faculty commitment: We are providing support for professional development for faculty to discover better ways to include relevant strategies and content in their classrooms and to create and sustain research agendas. Some specific areas are through the Mathematics Communities of Practice (final year of support from NSF SEMINAL) and the Course Conversations for entry level math. The Learning Lab BAM-C grant is also part of this effort.
 - Assist leadership: We are providing organizational support for programming and outreach in support of all students in math classes. Some specifics are working with the GE office and providing materials to advisors (via the GE office) to

better communicate options to students, and, in better times, providing the Math Proficiency Assessment so that students can identify their ideal placement.

Another important component of this work is done in the Math Lab. The Math Lab, housed in the College of Science, is a community learning space that connects Math & Stats graduate Teaching Associates (TAs), undergraduate Learning Assistants (LAs), and students. This study space is designed to support students in the entry-level math and statistics courses and on the STEM pathway: MATH 110, MATH 115, MATH 118, MATH 120, MATH 125, STAT 100, STAT 101, and STAT 110. Students are encouraged to meet with study groups, hang out and work on homework, or drop in for your TA's or LA's office hours. All of these efforts are being done virtually while we deliver remote instruction.

- Improve the student experience overall in math classes: We believe our efforts in lower division math can result in better recruitment and retention of mathematics majors. Other efforts in this area include incorporating innovative pedagogy, making the curriculum more relevant to STEM careers, and incorporating tools, strategies, and skills needed in STEM fields and for a more informed citizenry.
- Support faculty professional work in alignment with department priorities, goals and student engagement
 - Our hiring practices and position descriptions illuminate our ability to balance an expertise in teaching and research among our regular faculty. We work hard to hire faculty who exemplify the CSU and its commitment to diversity and equity.
 - We value the impact of our established lecturer faculty and their contributions to instructional excellence and consistency, especially at the lower division. This is evidenced by the inclusion of lecturer faculty in many aspects of our curriculum redesign for semesters, for compliance with EO 1110 and, most recently, the development of a new service course for the College of Business and Economics (Math 110: Finite Math for Business).
 - We continue to prioritize new tenure line faculty hiring.
 - We support research with undergraduate and graduate students.
 - Our RTP process and practice recognizes the research of discovery and the scholarship of teaching and learning.
 - We value and celebrate work that supports entry level student success from a scholarly perspective.
 - We meet regularly to ensure and emphasize faculty support and cohesion.
- Work collaboratively across the university and within the College of Science in support of student success
 - We have created new curriculum for entry level math in alignment with systemwide mandates.
 - We support our entry level students in collaboration with partner units across campus.
 - We provide ongoing support to all instructional staff in the form of peer support, graders, coordinated curriculum, communities of practice, and numerous opportunities to collaborate and contribute.
 - Faculty, staff and graduate students collaborate to create a positive, inclusive work environment that focuses on student success.
 - We are leaders in the creation and support of the Math Lab and the Learning Assistant Program.

- TAs in both Mathematics and Statistics now invited to take Math 605: Teaching Math at the University Level. This course is required for Math TAs.

C. Program Changes and Needs

Curriculum: Implementation of curriculum and support in response to Executive Orders (EO 1110 and EO 1100 (revised)) continue to be a focus for the department. We play a leadership role, in the institutional response and compliance efforts. Our work here aligns strongly with all of our department goals. We developed a co-requisite model for our entry level courses, all of our courses up to Calculus II are now coordinated, and we have created shared materials to facilitate the use of active learning and align curriculum across sections. Some of this work is funded through an NSF partner grant, SEMINAL, as well as a new collaborative grant from the California Learning Lab titled the Bay Area Math Collaborative (BAM-C): Precalculus, what's the Big Idea?. We continue to lead with the embedded peer tutor program, Learning Assistants (LAs), and Math Lab programming that houses the Learning Assistants and Teaching Associates, further building community among the LAs, TAs, and the students they serve. We intend for our next hire to be an applied mathematician who can help us build programming in computation and/or mathematical data science.

Students: With several new faculty, the opportunities for our undergraduate and graduate students to engage in research has been expanding. We hope to continue to hire faculty committed to working with our students on projects that extend and deepen their knowledge and open doors to them professionally in the academy, K-12 education, and industry. We are also committed to ensuring that compliance with the new EOs does not lead to a decrease in diversity among STEM and Business majors, something we see as a substantial risk in implementation. Students come to us from a wide variety of educational backgrounds and it is our responsibility to provide the same opportunities to all students. We should not allow our university to perpetuate inequities our students might have experienced in their K-12 education.

Faculty: We have two new tenure track faculty in AY 2020-21 who have added to the department's breadth of expertise as well as its diversity. We have been extremely lucky in our recent hires, successfully recruiting highly skilled educators and scholars who are committed to our students and our department focus on **Access, Equity, Flexibility, Community**. Dr. Donald Wolitzer entered the FERP program in Winter, 2018, and Dr. Chung-Hsing Ouyang entered the FERP program in Fall, 2018. We anticipate a challenging recruitment cycle in the face of uncertainty, less access to assigned time, the high cost of living in the Bay Area, and salaries that do not compete with our local sister campuses. In addition, we struggle at times to generate sufficient student demand to provide course choices for our majors. With the move to semesters, we offer more courses per term than under quarters, which strains our ability to staff courses and offer interesting electives. With the current level of staffing, we are hardly able to cover our major and graduate courses, let alone expand to more computation/data science courses. In fact, with the move to semesters and a base teaching load of 12 units, many of our tenure line faculty could find themselves with 4 preparations since doubling up on lower division courses would leave us without sufficient experienced staffing at the upper division and graduate levels. In addition, many innovations in our service courses may be negatively impacted due to the number of available TT faculty since the regular faculty, who are developing and implementing the new approaches, will be needed at the upper division and graduate level.

Staff: Our staffing will decrease in Fall, 2020, with the departure of our shared ASA II. We have a full time ASC II position serving as Office Manager for Mathematics. With budget cuts, we have not been able to sustain our student support for staff. This, alongside the loss of our ASA position, puts considerable strain on our ASC II. Finally, we have a full time Director for our Math Lab who is an SSP II. The department is complex in its service and major components and is in need of additional staff support to meet the needs of our students.

Resources: The current location and size of the Math Lab is sufficient to support students in Math 115, Math 15, Math 118, Math 18, Stat 100, Stat 100A, Stat 101, and Stat 101A. The LA program recently expanded to include Math 110/10, Math 120, Math 125, and also the new courses served by the STEM Lab. Due to this expansion, when we return to in-person services, the current Math Lab physical location will no longer suffice.

Assessment: We plan on continuing to use our current process of re-examining appropriate final exam problems using an RVF rubric. We have reduced the number of courses we assess per year with a focus on mastery in all areas.

Other: We are working towards further improving our implementation of active learning across the curriculum. We have a grant (SEMINAL) that has supported a robust implementation in Math 120, Math 130 and Math 131 and are looking forward to expanding this effort to Math 115. We recently received funding from the California Learning Lab which will help us implement more active learning and new “big ideas” approach in precalculus. This new project includes San Francisco State, Merit College, Berkeley City College, the College of Alameda. We are part of a proposal to NSF proposal that will advocate for Achieving Critical Transformations in Undergraduate Programs in Math (ACT UP Math) centered around issues of diversity, equity and inclusion.

II. SUMMARY OF ASSESSMENT

A. BS Program Learning Outcomes (PLO)

Students graduating with a BS degree in Mathematics will be able to:	
PLO 1	Apply the definitions, techniques and theorems of mathematics. (ILO Thinking and Reasoning: Quantitative Reasoning.)
PLO 2	Use mathematics to understand, explain and/or solve problems beyond a particular course.
PLO 3	Creatively conjecture and rigorously write, analyze and critique proofs.
PLO 4	Communicate mathematics effectively. (ILO Communication: Oral Communication.)

BS Program Learning Outcome(s) Assessed

PLO 2	Use mathematics to understand, explain and/or solve problems beyond a particular course.
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B. Summary of BS Assessment Process

Instrument(s): The department used a final exam question and a rubric. The rubric was used to score the exam question in the areas of readability, validity and fluency.

Sampling Procedure: The course for this year's assessment was chosen by the department when we created our five-year assessment plan but was changed due to artifact availability because of the COVID 19 pandemic. A final exam question was identified as a typical problem for the course that demonstrates the PLO to be assessed.

Sample Characteristics: The course selected is a course required for all majors. The exam question was selected carefully to ensure it included essential course content.

Data Collection: Final exams were accessed via blackboard by the department assessment coordinator. The problem was scored by the assessment coordinator for readability, validity and fluency using the rubric found in Appendix A.

Data Analysis: Course Assessed: MATH 330 Analysis I

Math 330, PLO 2: Use mathematics to understand, explain and/or solve problems beyond a particular course.

Problem: Prove if $\{a_n\}$ converges to a then $\{ca_n\}$ converges to ca

	Missing	Emerging	Developing	Mastering
Readability	0%	0%	30%	70%
Validity	0%	30%	0%	70%
Fluency	0%	20%	10%	70%

These scores indicate 70% of the students have mastered the ability to write a readable solution, 70% mastered and 30% are emerging the ability to write a valid proof, and 70% of the students mastered the ability to write a solution with fluency. These scores indicate that most of the students have developed or mastered the ability to write a readable solution about sequences of numbers, most of the students have mastered the ability to write a valid solution and 70% of the students have developed or mastered the ability to write a solution with fluency. The department should consider strategies to increase the percentage of students mastering writing a valid and fluent solution. The department should also explore why there is a high percentage of students who could not write a valid solution.

C. Summary of BS Assessment Results

Main Findings: This year most students performed well at all three levels, yet there was still a high percentage of students who performed poorly. The department needs to find ways to increase performance at all levels.

Recommendations for Program Improvement: The department needs to work on setting and communicating to instructors and students the essential topics for each course and how to include validity and fluency practice throughout the coursework.

Next Step(s) for Closing the Loop: Since there have been two years of semesters at CSUEB now, the department is updating expanded syllabi for semester courses which will include more details regarding course topics, depth of study, grading guidelines, and assessment expectations at the introductory, developing or mastery level for readability, validity and fluency in student work. Professors will be encouraged to share the assessment rubrics with their students.

Other Reflections: The work described above is a huge project. We have guidelines ready but did not have time to do a revisit this past summer since we needed to prepare for online teaching. We will need to continuously improve our course packets for instructors.

D. BS Assessment Plans for Next Year

Year 3: 2020-2021	
1. Which PLO(s) to assess	PLO 3
2. Is it aligned to an ILO?	No
3. If yes, list ILO.	
4. Course name and number	MATH 340 Modern Geometry
5. SLO from course	Students who successfully complete MATH 340 Modern Geometry will be able to <ul style="list-style-type: none">1. Apply the definitions, techniques and theorems of modern geometry.2. Creatively conjecture and rigorously write, analyze and critique proofs in modern geometry.
6. Assessment activity	Final Exams
7. Assessment Instrument	Re-score final exam questions using the Readability, Validity and Fluency Rubric
8. How data will be reported	Quantitative
9. Responsible person(s)	Kathy Hann, Mathematics EEC representative
10. Time (which semester(s))	Collect exams Fall 2020, rescore and analyze Spring 2021
11. Ways of closing the loop	Data will be reported in Mathematics Department Annual Report and discussed in faculty meetings to continuously improve the program.

A. MS Program Learning Outcomes (PLO)

Students graduating with a MS degree in Mathematics will be able to:

PLO 1	Evaluate and create proofs in graduate level mathematics using the fundamental definitions and theorems. (ILO Thinking and Reasoning: Quantitative Reasoning.)
PLO 2	Create solutions to problems using techniques in graduate level mathematics.
PLO 3	Communicate Graduate Level Mathematics Effectively. (ILO Communication)

MS Program Learning Outcome(s) Assessed

PLO 2	Create solutions to problems using techniques in graduate level mathematics.
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B. Summary of MS Assessment Process

Instrument(s): The department used two comprehensive exam questions and a rubric. The rubric was used to score the exam questions in the areas of readability, validity and fluency.

Sampling Procedure: A comprehensive exam question was identified as a typical problem for the exam that demonstrates the PLO to be assessed. The problem was chosen by the assessment teams.

Sample Characteristics: The course selected is a course required for all math master's students. The exam question was selected carefully to ensure it included essential program content. This selection was done during one of the monthly department meetings.

Data Collection: Comprehensive exams were collected by the department assessment coordinator. The problem was scored by the faculty for readability, validity and fluency using the rubric found in Appendix A.

Data Analysis: Course Assessed: MATH 692 Graduate Capstone

Math 692, PLO 2: Create solutions to problems using techniques in graduate level mathematics.

Problem 1: Implementing the Complimentary Slack Theorem

	Missing	Emerging	Developing	Mastering
Readability	0%	0%	17%	83%
Validity	0%	0%	50%	50%
Fluency	0%	0%	33%	67%

These scores indicate that 50% of the students have mastered the ability to write a valid solution, 83% mastered writing a readable solution and 67% have mastered writing a fluent solution. Half of the students are still developing writing valid solutions. The department should consider strategies to increase the percentage of students mastering this important problem solving skill.

Problem 2: Establishing uniform convergence of a sequence of functions

	Missing	Emerging	Developing	Mastering
Readability	0%	0%	75%	25%
Validity	0%	75%	25%	0%
Fluency	0%	25%	75%	0%

These scores indicate that 75% of the students are only emerging on the ability to write a valid solution, 25% mastered writing a readable solution and none of the students have mastered writing a fluent solution. All of the students are still emerging or developing the skills to write valid solutions. The department should consider strategies to increase the percentage of students mastering this important problem solving skill.

C. Summary of MS Assessment Results

Main Findings: This year most students demonstrated that they have not yet mastered creating valid mathematical solutions to problems.

Recommendations for Program Improvement: The department needs to work on ensuring that strong problem solving skills are developed within the coursework of the program. High expectations need to be set and communicated to the graduate students.

Next Step(s) for Closing the Loop: The department is updating expanded syllabi for semester courses which will include more details regarding course topics, depth of study, grading guidelines, and assessment expectations at the introductory, developing or mastery level for readability, validity and fluency in student work. Professors will be encouraged to share the assessment rubrics with their students.

Other Reflections: The work described above is a huge project. We have guidelines ready and did a revisit this past summer but we will need to continuously improve our course packets for instructors.

D. MS Assessment Plans for Next Year

Year 3: 2020-2021	
1. Which PLO(s) to assess	PLO 3
2. Is it aligned to an ILO?	Yes

3. If yes, list ILO.	Communication
4. Course name and number	MATH 692 Graduate Mathematics Capstone
5. SLO from course	Students who successfully complete MATH 692 will have mastered communicating mathematics in at least four areas of Graduate level mathematics
6. Assessment activity	Comprehensive Exams
7. Assessment Instrument	Re-score Comprehensive Exam questions using the Readability, Validity and Fluency Rubric
8. How data will be reported	Quantitative
9. Responsible person(s)	Kathy Hann, Mathematics EEC representative
10. Time (which semester(s))	Rescore and analyze Spring 2021
11. Ways of closing the loop	Data will be reported in Mathematics Department Annual Report and discussed in faculty meetings to continuously improve the program.

III: **DISCUSSION OF PROGRAM DATA & RESOURCE REQUESTS**

A. Discussion of Trends & Reflections

Notable Trends

Enrollment: Since a precipitous drop in FTES between F17 and F18 due to the elimination of developmental math, our overall FTES have remained fairly stable at 449 in F18 and 418 in F20. Ongoing changes in first year B4 requirements in the departments we serve impact freshman enrollment especially. The College of Business and Economics changed its B4 requirement from Math 180 (with a Math 115 prereq) to Math 110 (with no college level prereq) in F20. We expect this change to have a long term impact on our enrollment due to the reduction in students in Math 115 and also fewer transfer students in the College of Business and Economics in need of mathematics. Our undergraduate majors have remained stable from 72 in 2015-16 to 78 in 2020-21. It is of note that we had a surge up to 99 majors in 2017-18, but the trend has been stable overall. As mentioned earlier in the report, we hope to introduce new computational/data science focused courses to attract students looking for a mathematically rigorous data science degree, for which job prospects in the region, and nationally, are very strong. This type of program is becoming more and more common and there are resources produced by professional organizations to support this work. We also hope to work collaboratively with Computer Science and Statistics and Biostatistics where possible. Our department has several programs and scholarships for “future teachers” (including the NSF NOYCE grant) and offers an accredited single subject waiver program that is attractive to students considering a career teaching high school. We plan to continue to leverage this strength and support and encourage our Mathematics BS students to pursue teaching credentials at CSU East Bay. We also plan on working with Liberal Studies and Teacher Education to support an application for a CSET Waiver in Foundational Level Mathematics. We are one of only a few CSUs (perhaps the only one) that doesn’t offer a year long sequence of mathematics courses for future elementary school teachers. This is an important service that we used to provide, but that requires collaboration with the programs in which those students enroll (Liberal Studies). Obtaining a waiver, encouraging an update of the LBST program, and relaunching these classes by Fall, 2022, is an

important goal for the department that will also impact our undergraduate enrollment.

Our graduate enrollment has been in decline (45 in 2015-16 to 28 in 2020-2021). We continue to stress teaching opportunities for our graduate students, many of whom land coveted tenure track positions at local community colleges based, in part, on the opportunities we provide. With the elimination of developmental math, our students now start by teaching “co-requisite” workshop courses and those who demonstrate strong skills in the classroom are able to move up to teaching “parent” courses within a year. They must also all take Math 605: Teaching Math and the University Level. While continuing to support our future community college MS students, we will also look at alternative recruitment strategies and explore computational/data science options at the graduate level.

Instructors: Our SFR continues to hold steady at approximately 27. The table below details our instructional staffing over the past two years. It is notable that the data show that a higher percentage of our students are being taught by lecturers and/or TAs than over the past two years. This is reflective of our need for more tenure track faculty in order to ensure that our lower division service courses (which often have higher enrollment than major courses) are staffed with TT faculty when possible in order to maintain consistency and quality for all of our students. With our TT faculty securing external funding at an increasing rate with the accompanying reduction in instructional assignments, we hope to be able to maintain this practice by making additional TT hires. We also want to maintain opportunities for our graduate students to grow as teachers. We are working within the new structures to support all students we serve. We are also working to expand and sustain our Community of Practice model in the STEM pathway. One proposal has been to have the role of course coordinator rotate among our tenure line faculty and commit to having the coordinator teach the coordinated course at least once during the AY. This would allow all TT faculty the opportunity to teach our entering students, to gain first hand experience with that curriculum, and to interact with our lecturers and TAs. This would require that we have sufficient TT faculty to also staff our major and graduate level courses.

	F17	F18	F19
SFR	27.1	26.5	27.2
TT FTEF	27%	42%	31%
Lect/TA FTEF	72%	57%	69%
TT FTES	26%	37%	24%
Lect/TA FTES	74%	62%	76%

Diversity: The data show continuing strong enrollment by Hispanic/Latina(o) students within the undergraduate Math Major (34% in F19). We are excited about the potential to leverage this growth within the context of our new HMI status. Our HUS enrollment has increased from 35% in F17 to 45% in F19 in our BS and holding steady for our MS over the same period of time (25% in F17 and 26% in F19).

Reflections on Trends and Program Statistics

It is of note that for a service department such as Mathematics, data about majors simply does not tell the full story. A large percentage of FTEs are in our service courses. As the university continues to strengthen its reputation in STEM and Business, we expect this responsibility to increase and enrollment to continue to grow. Also with the Graduation Initiative in place and the bottleneck/gateway positioning of many of our courses, we are making significant changes and improvements in the instructional practices in our service courses. All such moves require permanent faculty leadership, a role that is most naturally played by our tenure/tenure track faculty. At this time we have only a few tenure/tenure track faculty teaching classes below the level of Calculus I, and even Calculus I and II have significant number of lecturers serving as instructors. Our current faculty composition is making it challenging to staff our major and graduate level courses while providing all students with a variety of options at the lower division. With two long time tenured professors having recently entered FERP, one having retired, and another on leave, our ability to continue to have TT faculty in our lower division classes is tenuous. It is of note that we have had lecturers teaching Math 300 and Math 305 in several recent semesters, both of which are critical transition courses for our majors. While these lecturers were selected because of their strong instructional and mathematical skills, it is less than ideal to have such courses taught by lecturers.

B. Request for Resources

1. Request for Tenure-Track Hires: As mentioned above in notable trends, our need for more tenure track faculty to staff our major courses and to keep consistency and quality in our lower division service courses is clear. Our goal is to create more opportunities in computation and mathematical data science, both of which are gaps in our current faculty expertise. We need at least 1 new TT faculty to cover upper division and graduate courses in existing applied areas and 1 to help launch this new area of focus. Without such searches, we may not be able to cover our upper division major courses and graduate courses with tenure line faculty and maintain TT staffing in lower division gateway courses, an essential component of our success thus far in improving student outcomes in these classes. In support of the Graduation Initiative, we are committed to having tenure track faculty teaching a majority of our calculus classes, and think our overall program would benefit from having tenure line faculty teaching in college algebra, precalculus, and Math for the Arts and Humanities. We also anticipate needing to re-launch a foundational level math program, necessitating courses that have yet to be offered under semesters.

2. Request for Other Resources: With the growth of the Math Lab, additional consistent funding for the Math Lab is essential. In addition, a larger space is now needed as the Learning Assistant Program expands beyond the current course offerings. The Math Lab and the Learning Assistant program are essential to our support of student success in B4-GE Math/QR courses. With the loss of our shared ASA II and no funding for student assistants, we will need more staff support centrally or the ability to replace our ASA II position.

III. APPENDICES

Appendix A - Readability, Validity, Fluency Rubric

CSU East Bay Mathematics, BS
AY 2018_19

Solving Problems RVF Rubric – Readability, Validity, Fluency

	Missing (0)	Emerging (1)	Developing (2)	Mastering (3)
Readability	Informal or non-mathematical language is used. There is misuse of notation/symbols.	Some improper mathematical language or notation is used.	Mostly proper mathematical language and notation is used.	Proper mathematical language and notation is used.
Validity	Significantly inaccurate or irrelevant steps in algorithms are present. Important information is missing.	Mostly accurate steps in algorithms are present. May include some irrelevant or unjustified statements.	Steps in algorithms are accurate and relevant.	Steps in algorithms are accurate and relevant and connected/deduced correctly.
Fluency	No coherent flow of ideas Listing facts without a sense of how to link them to get a correct solution.	Partially coherent and organized, but inconsistent. Appeals to intuition. Some unjustified or improperly justified steps in algorithms are present.	A correct and essentially complete solution given. Logic, steps in algorithms, and flow overall sound. Some small gaps in solution may require “benefit of the doubt.”	A correct, fully justified, and complete solution given. Elegance or mathematical maturity present.

Appendix B (next page) - Faculty work in support of Department Goals

APPENDIX B					
Name	Instructional Innovations	Publications and Work in Progress	Awards/Grants	Presentations and dissemination	Leadership/Service
Andrea Arauza Rivera	<ul style="list-style-type: none"> * Flipped classroom in the Spring by creating guided notes accompanied by videos and exercises for students to attempt. * Implemented 2 assessment styles which are not centered in timed high stakes exams. The first is a mastery grading and the second is a systems which gives students a choice over how they are assessed (via an exam, presentation, written paper, concept map). 	<p>Submitted: "Bounds on the Hausdorff measure of level-N Sierpinski gaskets." Involve Journal of Mathematics. This is a paper coauthored with a student, Edwin Lin.</p> <p>In progress: Working on a project with graduate student Matt McClinton which we hope will generate a publication in a journal on recreational math. The project involves an app game and developing an algorithm with produces solutions to certain puzzles.</p>	<p>Awarded: MAA Tensor SUMMA grant providing stipend * MAA Golden Section talk.</p> <p>Under review: Funding for student research from the PU</p>	<p>* Scheduled to give 3 talks at the AMS western sectional which was cancelled because of COVID.</p>	<p>* Serving a second term as the Latinx Faculty Fellow for the Office of Diversity.</p> <p>* Organized a reading group in Summer 2020 to provide a space where the department could talk openly about race and education.</p>
Julie Glass	<ul style="list-style-type: none"> * Used group work and final project to provide opportunities for students to demonstrate learning in multiple ways. * Take home final exam component in Math 320 that allows students * Supported Math Department in transition to remote instruction due to COVID. 	<p>Glass, J., Karaali, G., Matching Kids to Schools: The School Choice Problem, in Mathematics for Social Justice: Resources for the College Classroom, edited by Karaali, G., Khadjavi, L., (Classroom Resource Materials Volume 60, MAA Press, American Mathematical Society, 2019), pages 155–170. Book website: https://bookstore.ams.org/clm-60</p> <p>In progress: An evaluation of co-requisite support, embedded peers, and community learning spaces.</p>	<p>PI for California Learning Labs funded project, "Bay Area Math Collaborative: Precalculus, what's the big idea?"</p>	<p>Facilitated weekly professional development workshops for Mathematics during Summer, 2020.</p>	<p>* Chair, Department of Mathematics * General Education, Overlay and Code Subcommittee of CIC (Chair, 2014-2018) * Executive Committee of the Academic Senate, CSUEB * Member of the Academic Senate CSU, ASCSU Academic Preparation and Education Programs (APEP), General Education Advisory Committee, and Institute for Teaching and Learning Advisory Board</p>
Kathy Hann	<ul style="list-style-type: none"> * Moved classes online. * Implemented student project presentations for Math 340 Modern Geometry. Student reviews uniformly mentioned these presentations as a highlight of the course both as presenters and watching the presentations. * Use Library Liaison to learn about finding resources and how to do professional bibliographies 		<p>* PI, Supporting Excellence, Effectiveness and Diversity (SEED) in STEM Teacher Education, \$1.2 million Robert Noyce grant * Member of the Program Recruitment and Retention Research Action Cluster or Math Teacher Education Partnership (MTEP). * Co-PI, MSTL Math and Science Teaching Initiative, grant from the CSU Chancellor's office. * Recipient of the 2020-21 Rosemary and Matthew Spitzer Distinguished Science Faculty Award</p>		<p>* Noyce Grant PI * STEM teacher Recruitment Task Force, * MSTI co-PI * Assessment Rep for Department of Mathematics</p>
Jesus Oliver	<ul style="list-style-type: none"> * Developed and implemented a formal student presentation format, "Presenter/Reporter," to enhance learning through class presentations (online) * Student Research Projects in Math 675 (online) * Video Assignments and HW assessments (online) * Google Jamboards + Zoom Breakout rooms (online) * Guided Notes for graduate courses (in person and online) * AV Lab Experiment with Engineering department. 100+ students participated in a visualization activity + group work in visualizing volumes of revolution at the AV Lab Engineering space. 	<p>Publications:</p> <ol style="list-style-type: none"> 1) J. Oliver, J. Olkin "A Community of Practice Model for Infusing Active Learning," PRIMUS (published April 2020). 2) J. Oliver, J. Sterbenz "A Vector Field Method for Radiating Black Hole Spacetimes", Analysis and PDE (Published Jan 2020) <p>Submitted or In Progress:</p> <p>J. Oliver, J. Olkin, A. Stanculescu (student) "Investigations Into Closing Opportunity Gaps," MAA Notes Volume on Diversity, Equity, and Inclusion (under review).</p> <p>"A Morawetz Estimate for the Wave-Klein-Gordon System" (in progress). Collaboration with Philippe LeFloch (Sorbonne University, Paris, France).</p> <p>Student collaborators: Greg Mwamba, Jon McCollum, Yanru Chan, Andrew Stanculescu, Angel Macias. Students are working on deliverables taking different forms: research manuscripts, research reports, posters to be presented at the MAA Golden Section meeting and MAA Joint Meetings students session. Greg Mwamba presented a poster at both of these avenues in AY 2019-2020.</p>	<p>* SEMINAL CSUEB Grant extended through AY 2020-2021.</p> <p>* Faculty Support Grant 2019-2020 (CSUEB).</p>	<p>Invited talks given:</p> <p>* AMS Sectional Meeting, Special Session on "Wave Phenomena in Fluids and Relativity," University of Wisconsin-Madison, 2019</p> <p>* JMM/AMS Joint Mathematics Meetings: MAA Contributed Paper Session on Active Learning in Introductory Courses, Denver, 2020</p> <p>*Progress Through Calculus/SEMINAL Joint Meeting, Nebraska, 2019</p>	<p>Committee Instruction and Curriculum (CIC) member 2019-2021.</p>
Julia Olkin	<ul style="list-style-type: none"> * Focused on how to make classes engaging online. * Use of breakout rooms in my classes. * Evaluated options for online whiteboards, settling on Google Jamboards, which allows uploading images and be prepopulated with class exercises. Jamboards allow the instructor to view student work in realtime while they are in breakout rooms. * Class sessions started by posting a math puzzle, teaser, cartoon, mental math problem, or something to engage the students. Use results as a bridge into the class community. 	<p>Publications:</p> <p>* J. Oliver, J. Olkin "A Community of Practice Model for Infusing Active Learning," PRIMUS (published April 2020).</p> <p>Submitted or In Progress:</p> <p>* J. Oliver, J. Olkin, A. Stanculescu (student) "Investigations Into Closing Opportunity Gaps," MAA Notes Volume on Diversity, Equity, and Inclusion (under review).</p> <p>* Working with Jesus Oliver and Andrew Stanculescu (undergrad) on exploring Calculus I data differences among URM, Pell students, gender, future STEM classes, etc.</p>	<p>* MSTI (Math and Science Teacher Initiative) grant (\$100,000 from Chancellor's Office, \$75,000 from Lottery money) awarded in AY 2019-20.</p> <p>* STEM Challenge Grant, \$100,000, awarded in AY 2019-20</p> <p>* Applying for same in AY 2020-21. Faculty Learning Program with Associate Dean Danika LeDuc: Transforming STEM Teaching. Working with 4th cohort in calendar year Jan-Dec. 2020. 12 STEM faculty per calendar year; Increase active learning, improve pedagogy, understand student learning, and more.</p>	<p>* 1/18/20: Talk: Joint Math Meetings, Denver, "A Community of Practice model for Infusing Active Learning in the Classroom." (joint work with Jesus Oliver)</p> <p>* 7/15/20: College of Science SEARCH (Science, Education, and Revising Course Help) Series Seminar: "Thoughts and Tidbits on Improving Active Learning in an Online Environment."</p> <p>* 7/20/20: Presentation to Math Methods Class in Teacher Ed: "Whats Going On in College Math Classes."</p> <p>* 7/23/20: Math Dept. Workshop: "Creating Community and Motivating Students Online."</p>	<p>Served on College of Science RTP committee in AY 19-20. Am Graduate Coordinator Co-Chair of Board of Directors for Institute for STEM Education</p>
Shirley Yap		A Theodorus Construction, published in the American Mathematical Monthly, May 1919			