**Porterville College Mission Statement**:

With students as our focus, Porterville College provides our local and diverse communities quality education that promotes intellectual curiosity, personal growth, and lifelong learning, while preparing students for career and academic success.

In support of our values and philosophy, Porterville College will:

1. Provide quality academic programs to all students who are capable of benefiting from community college instruction.
2. Provide comprehensive support services to help students achieve their personal, career and academic potential.
3. Prepare students for transfer and success at four-year institutions.
4. Provide courses and training to prepare students for employment or to enhance skills within their current careers.
5. Provide developmental education to students who need to enhance their knowledge and understanding of basic skills.
6. Recognize student achievement through awarding degrees, certificates, grants, and scholarships.

**Guided Pathways Framework**:

1. Clarify the Path: Create clear curricular pathways to employment and further education.
2. Enter the Path: Help students choose and enter their pathway.
3. Stay on the Path: Help students stay on their path.
4. Ensure Learning: Ensure that learning is happening with clear outcomes.

**Program Mission Statement**:

The Mathematics Division supports the mission of Porterville College. The division faculty are committed to making the learning of mathematics interesting, meaningful, and enjoyable to all students, while providing complete coverage of course topics to meet the Learning Outcomes in each course and program. We are committed to placing all students directly into transfer-level math, providing co-requisite support where needed, maximizing student success and equity.

**Student Learning Outcomes**:

One full cycle of Student Learning Outcomes assessment will be completed by the summer of 2023. As per division agreement, 70% is the required mastery level for each SLO/PLO. 100% of the math classes have been assessed in the past two years. Within one month of the conclusion of each semester, the SLO division representative sends SLO assessment forms to faculty members for each of the math classes they are teaching.

Selection of SLO assessment tools is currently the instructor’s choice; however, a goal of the Mathematics Division is to develop a common assessment of SLOs in each class beginning in the fall of 2023. Examples of assessment tools include online

and in-class quizzes, homework assignments, exams, and group assignments. Upon completion of the assessments, faculty members submit their SLO assessments to the SLO division representative, who compiles them in an Excel spreadsheet. SLO/PLO results of all math classes can be found at the following site:

<https://docs.google.com/spreadsheets/d/1kSMYeFcsnJ8FqoM2Ds7xgC2SUBAJyU1b9QNZ0hlAp3Q/edit?usp=sharing>

Follow up discussions of results have occurred in a number of classes, during which faculty members have identified weaknesses/strengths of their students in specific SLOs, and well as specific teaching strategies that have been helpful. Some examples of this include conversations about specific SLOs in Math P122 (Introduction to Probability and Statistics) and Math P100 (College Algebra for Liberal Arts). Success rates for SLOs with assessments displaying lower than 70% have been noted and discussed during past meetings or scheduled to be discussed in future division meetings. Sharing of strategies and best practices has helped all faculty throughout our division.

At the conclusion of each 4-year cycle, we re-evaluate the SLO/PLO assessment process, making modifications in SLOs/PLOs and individual course outlines as needed and developing a new plan for the next assessment period. Lead faculty members are assigned to specific classes and are responsible for determining

that SLOs in their areas are assessed in a timely manner.

Below are the 2019 – 2023 SLO lead faculty members for each class. Following this are the four-year assessment plans for the Mathematics Division.

**Program & Student Learning Outcomes**

***Assessment Plan – Mathematics Division***

The learning outcome curriculum map for the Mathematics Program, Engineering Program, and transfer courses will be assessed in a four-year cycle as follows:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | Year  Course | 2019-2020 | 2020-2021 | 2021-2022 | 2022-2023\* |
| E  N  G  I  N  E  E  R  I  N  G  A  S | M  A  T  H    A  S  T | Math P103 | PLO # 1,2  SLO # 1,2 | PLO # 3,4  SLO # 3 | PLO # 5  SLO # 4 | The fourth year is intended for  division assessment and planning of  the next four-year cycle. |
| Math P104 | PLO # 1,2  SLO # 1,2 | PLO # 3,4  SLO # 3 | PLO # 5  SLO # 4 |
| Math P205 | PLO # 1,2  SLO # 1,2 | PLO # 3,4  SLO # 3,4 | PLO # 5  SLO #5 |
| Math P206 | PLO # 1,2  SLO # 1,2 | PLO # 3,4  SLO # 3,4 | PLO # 5  SLO #5,6 |
| Math P207 |  | PLO #1,2  SLO # 1,2,3 | PLO # 3,4,5  SLO #4,5,6 |
| Math P208 |  | PLO #1,2  SLO # 1,2,3 | PLO # 3,4,5  SLO #4,5 |
| Phys 104A | PLO # 1,2 | PLO # 3,4 | PLO # 5 |
|  | Phys 104B | PLO # 1,2 | PLO # 3,4 | PLO # 5 |
| Engr P110 | PLO # 1,2  SLO # 1,2 | PLO # 3,4  SLO # 3,4 | PLO # 5  SLO # 5,6 |
| Engr P120 | PLO # 1,2  SLO # 1,2 | PLO # 3,4  SLO # 3,4 | PLO # 5  SLO # 5 |
| Engr P132 |  | PLO # 1,2,3  SLO # 1,2,3 | PLO #4, 5  SLO # 4, 5 |
| Engr P260 |  | PLO # 1,2,3  SLO # 1,2,3 | PLO #4, 5  SLO # 4, 5 |
| G E N E R A L  E D U C A T I O N | | Math P122 | SLO # 1,2 | SLO # 3 | SLO # 4 |
| Math P22\* | SLO # 1\*,2\* | SLO # 3\* | SLO # 4 |
| Math P101 | SLO # 1,2 | SLO # 3,4 | SLO # 5 |
| Math P101A | SLO # 1,2 | SLO # 3 | SLO # 4 |
| Math P100 | SLO # 1 | SLO # 2 | SLO # 3,4 |
| Math P50X\* | SLO # 1 | SLO # 2\* | SLO # 3\*,4\* |
| Math P115 | SLO # 1,2 | SLO # 3 | SLO # 4 |
| Math P116 | SLO # 1,2 | SLO # 3 | SLO # 4 |
| Math P118 |  | SLO # 1,2 | SLO # 3,4 |
| Math P18X\* |  | SLO # 1,2 | SLO # 3,4 |
| Math P110 | SLO # 1 | SLO # 2 | SLO # 3,4 |
| Math P10X\* | SLO # 1\* | SLO # 2\* | SLO # 3\*,4\* |

\*Signifies that co-requisite SLOs will be assessed at this time as well as parent course SLOs.

SLO Lead Faculty Members

Faculty Name – Responsibility

Dustin Acres – Math P110, Math P10X

Sherie Burgess – Math P118, Math P18X, Math P122, P22

Elizabeth Flynn – ENGR P110, P120, P132, P260

Miguel Ruelas – Math P103, P104, P205, P206, P207, P208

Ian Onizuka – Outcomes Representative

Cindy Pummill – Math P115, P116

Di Reagan – Math P100, P50X, P101A, P101

Jon Satko – Phys 104A

**Program Learning Outcomes:**

**Mathematics AS-T**

The PLOs for the AS-T degree in Mathematics are the following:

1) Use mathematics to investigate, model, and solve real-world problems using a variety of problem-solving methods.

2) Use technology as a tool for exploring mathematical concepts.

3) Demonstrate an understanding of concepts and skills needed for future mathematics courses or courses in related disciplines.

4) Demonstrate a solid understanding of functions from multiple perspectives.

5) Demonstrate an ability to work with and analyze mathematical relationships.

We are beginning to assess the program learning outcomes by having important conversations and discussions about how they will be assessed in the future.

**Engineering AS**

The PLOs for the AS degree in Engineering are the following:

1) Explain engineering ethical principles and standards.

2) Apply the engineering design process to design projects.

3) Apply appropriate engineering analysis techniques for engineering applications.

4) Legibly and effectively communicate engineering solutions to others, whether the audience members are engineers or not.

As a new program, not all engineering courses in the program have been offered. Thus, we have not been able to fully assess the program learning outcomes.

**Program Analysis and Trends**:

***Data Review***

**Enrollment – Mathematics**

Enrollment in math courses decreased due to the implementation of AB 705, decreasing from 2,586 in 2016-17 to 1,803 in 2020-21. The Math Faculty at Porterville College elected to eliminate non-transferrable math courses, opting for a co-requisite model, allowing all students to directly enroll in a transfer-level course. Students are no longer required to enroll in pre-requisite courses, thus decreasing the total number of mathematics courses a student is required to take.

The following graph shows 2020-21 had a significant decrease in enrollment, most likely due to the COVID-19 pandemic in which courses were offered strictly in an online modality.

**Graphical user interface, chart, bar chart

Description automatically generated**

In reviewing trends for math courses over the past five years show stratification of enrollment by gender, ethnicity, and age categories and are similar to the college population. Increases I the method of instruction went from 15% in 2016-17 to 59% in 2020-21. Due to the COVID-19 pandemic, we offered more course in an online modality.

Graphical user interface

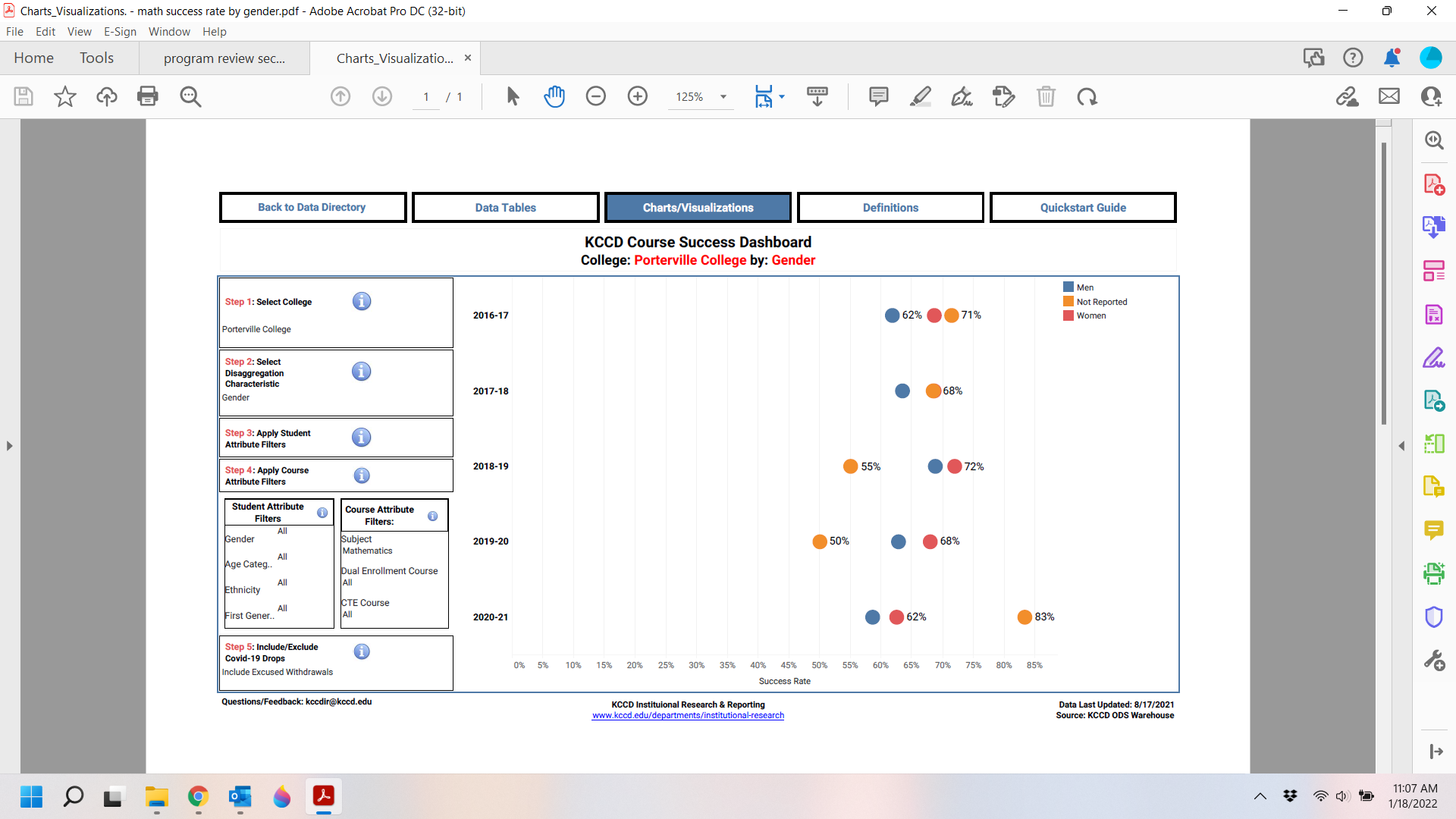
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**Success Rates – Mathematics**

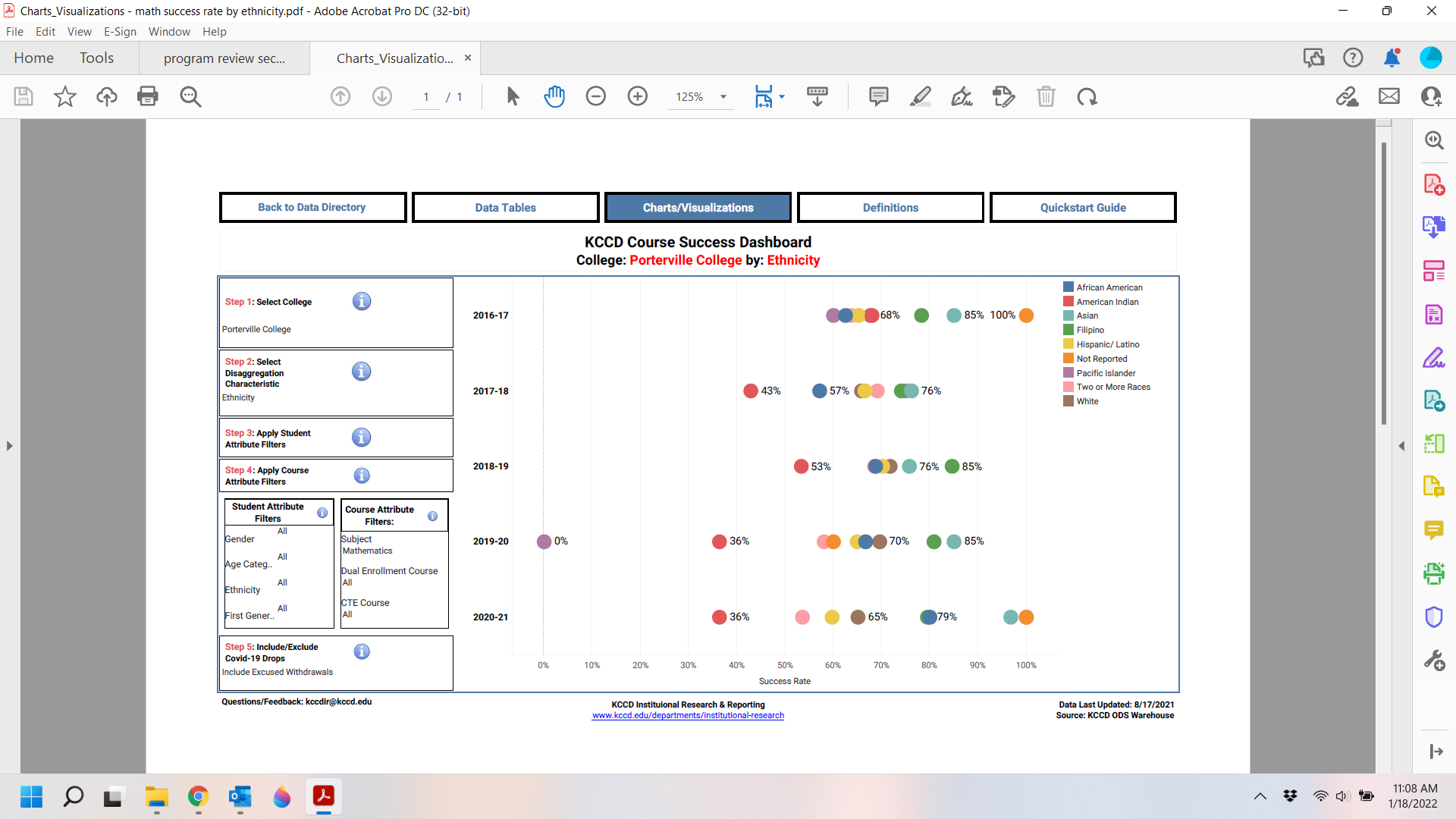
Success data shows math courses have been increasing their success rates, rising from 66% in 2016-17 to 71% in 2018-19. With the emergence of the COVID-19 pandemic our division, like many others, saw a decrease in success rates dropping to a low of 61% in 2020-21.

It is important to note that the Mathematics Division embraces the spirit of AB 705 and allows students to register directly into a transfer-level mathematics course. Our success rates have far exceeded that of other colleges, in some cases our division success rates are 20 percentage points higher than other community colleges. When taking into account students who are successful in a transfer-level course within one term, the [statewide success rate is at 46%](https://www.ppic.org/publication/community-college-math-in-californias-new-era-of-student-access/) during the pandemic compared to 61% here in the Mathematics Division at Porterville College.

Success rates by gender show a 7% difference between male and female students in 2016-17. Although there has been a decrease in success rates overall, the gap was reduced to a 3% difference in 2018-19 and 2020-21. In the past five years, female students have higher success rates than males.

****

The following graph represents the success of students in mathematics courses by ethnicity. Several groups have only a few students (n < 30), in which no conclusions should be drawn.

****

Graphical user interface, application

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Graphical user interface, application

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Reviewing math success rates of larger groups (n ≥ 30) show the differences between those who identify as Hispanic/Latino and those who identify as White were beginning to narrow in the 2016-17 to 2018-19 academic years, ranging from 1% to 3%. However, 2019-20 and 2020-21 show the gap widening to 5%. This may be, in part, an effect of our online transition due to the COVID-19 pandemic. There are more noticeable differences with students who identify as Asian or Filipino. The largest gap occurred in 2016-17 when there was a 20% difference between those who identify as Hispanic/Latino (65% success rate) and Asian (85% success rate).

It should be noted that the number of students enrolled in math courses, who identify as Asian or Filipino, is a significantly smaller sample size as compared to the Hispanic/Latino student sample size.

Graphical user interface, application

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Graphical user interface, application

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Success rates of first-generation college students enrolled in math courses was at its lowest in 2019-20, with a difference of 2%, and hovered around 3% - 4% in the three previous years. The most recent 2020-21 academic year shows a larger gap with a 7% difference. The COVID-19 pandemic may have impacted the increased difference and efforts to investigate this wider gap will need to be explored.

A screenshot of a computer

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Graphical user interface, application

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**AS-T Awards – Mathematics**

The number of AS-T Mathematic degrees offered decreased from 2016-17 to 2017-2018. However, they began to increase at peaked in 2019-20, with 13 degrees conferred. In 2020-21 there were eight conferred Math degrees. Stratification of Math degrees by ethnicity show there are more Math degrees conferred to those students who identify as Hispanic/Latino consistently than any other ethnicity group. The Mathematics Division has discussed adding a MESA program to the college to help increase the number of degrees conferred and, as a Hispanic serving institution, continues to encourage our Hispanic/Latino students to enter the field of Mathematics.

Graphical user interface

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In the following graph, 2016-17 indicates two of the seven degrees were awarded to students who identify as female. In the past three years, only students identifying as male were awarded a Mathematic AS-T. The Mathematics Division is exploring methods to help our female students persist in the field of Mathematics. Creation of the new STEM Center has allowed our division to offer summer camps that target female middle and high school students, in an effort to expose them to the STEM fields before reaching college.

Graphical user interface

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The section count has remained relatively constant over the past five years. Math course offerings increased from nine unique courses to 15. With AB 705 implementation, several co-requisite courses were added including Math P010X, P22, P050X, and P018X.

Graphical user interface, application

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**Enrollment – Engineering**

The Engineering program is new and does not have five years of data to present. However, the past two years of enrollment in Engineering courses show an increase from 46 students in 2019-20 to 58 in 2020-21. In reviewing enrollment trends for engineering courses, the past two years show stratification of enrollment by ethnicity and age categories and are similar to the college population. In 2020-21 there were 81% of Engineering students who identified as Hispanic/Latino, 15.5% who identified as White, 1.7% identified as Asian, and 1.7% identified as Filipino.

Bar chart

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Engineering enrollment trends show 84.8% were students who identified as male and 13% identified as female in 2019-20, indicating a significant enrollment gap. The following 2020-21 academic year shows students identifying as female rose to 22.4%. It should be noted that these sample sizes are small, however the trend at Porterville College is not uncommon throughout our nation where [15% of the Engineering workforce in 2019 were female](https://www.census.gov/library/stories/2021/01/women-making-gains-in-stem-occupations-but-still-underrepresented.html#:~:text=Women%20working%20in%20engineering%20occupations,1970%20to%2015%25%20in%202019.). The Mathematics Division has discussed adding a MESA program to the college to help increase the number of degrees conferred and continues to encourage our female students to enter one of the Engineering fields.

Creation of the new STEM Center has allowed our division to offer summer camps that target female middle and high school students, in an effort to expose them to the STEM fields before reaching college. However, efforts to investigate this gender gap need to be explored.

Graphical user interface

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**Success Rates – Engineering**

Data shows engineering courses had a 67% success rate in 2019-20 and 68% success rate in 2020-21. There are only two years of data to draw from as our Engineering program is new, thus no trends can be identified at this time. We are monitoring success rates stratified by ethnicity, gender, first generation status, and age to identify emerging student trends.

**AS-T Awards – Engineering**

Not all degree applicable Engineering courses have been offered at this point. Thus, no Engineering degrees have been awarded as of 2020-21. Currently we offer a general Engineering degree with no specific concentration. As the Engineering program develops and grows, specific concentrations will need to be added in an effort to accommodate students transferring to four-year universities. For example, the pathway of courses required for Software Engineering is different than an Electrical Engineer.

**FTEF, FTES, and Waitlists**

Our division generated 21.08 FTEF in 2020-21 with only seven full-time faculty members, suggesting the division could support at least two additional full-time faculty members. In traditional, non-pandemic years, our FTEF ranged from 22.13 in 2016-17 to 22.61 in 2018-19. In 2019-20, we saw a small drop in FTEF down to 20.95 due to reduced enrollments during the COVID-19 pandemic.

The FTES dropped from 408.35 in 2016-17 to 309.01 in 2019-20. We expected a drop in FTES with the implementation of AB 705, as the decision by the division to promote equity in student completion also meant fewer students would need to enroll in math courses. Despite the drop in FTES, our waitlists remain high, ranging from 232 in 2019-20 to 345 in 2018-19. This indicates our division could support two additional full-time faculty members and still have students waitlisted on the first day of instruction.

***Changes in Program over Last Three Years***

**Curriculum**

The Mathematics Division has seen significant changes in our curriculum over the past five years, especially with the passing of AB 705. We eliminated all remedial/basic skills courses to increase access of transfer-level courses and opted for a co-requisite curriculum model. Several faculty members spent time visiting other Community Colleges throughout the state and began researching models that increase student access and success. The co-requisite model we built has aided in the timely transfer to universities for Porterville College students.

The following curriculum and program updates were made:

* Removed Math PQ, Math PS, Math P061, Math P055, and Math P051 curriculum from our schedule of courses. Allowing students to enroll directly into a transfer-level course.
* Added corequisites to all introductory transfer level courses (Math 110, Math 122, Math 100, Math 118) which allows all students to enroll directly into transfer-level classes.
* Modified our multiple measure assessment for incoming students which allows all students to register for transfer-level courses.
* Added Math 110: College Algebra for non-Stem students in an effort to create a new transfer-level option for students.
* Added Math 100: College PreCalculus I to improve alignment with our local High Schools.
* Added Math 116: Structure and Concepts II to improve alignment with elementary teacher education programs at the CSU’s.
* Added Math 118: Finite Mathematics which creates a new transfer-level option for Business students.
* Added Math 101A: Pre-Calculus and Trigonometry which increases student access to the current Calculus sequence.
* Split Differential Equations and Linear Algebra to create Math 207 and 208, which reduces the number of units required for STEM majors.
* Collaborated with the Business faculty at PC to add options for Business students transferring to Fresno State.
* Aligned our course review cycle to simplify the process of keeping our courses up to date.
* Updated the Mathematics AS-T Degree to allow new sequences of courses with reduced units in the program.
* Updated the Engineering AS Degree to allow new sequences of courses with reduced units in the program.
* Worked with the UC Merced Mappers to create seamless pathways for students transferring in Math.
* Collaborated with the Business faculty at PC to align math courses for Economics pathways with UC Merced Mappers.
* Updated our pathways in Math and Engineering to reflect additional options for completing a degree with fewer units.

**Jump Start**

The Mathematics Division has offered a week-long Jump Start Program with Math faculty almost every summer and during a few winter breaks. The Math Jump Start enables students to “test out” of a co-requisite course they were placed in, which is based on the multiple measures assessment model used by the division. In an effort to provide equity for our students, the faculty recently voted to dismantle challenge exams and instead use the Jump Start program as a means for determining whether a student should be placed in a co-requisite. Occasionally, students will request to take a challenge exam for placement into Calculus I. As a sole and independent assessment, challenge exams rarely demonstrate the full knowledge a student has. In the past 10 – 15 years no student has passed a challenge exam. Basing knowledge on one assessment may not accurately gauge whether the student will be successful in the challenge. Therefore, students who want to challenge their multiple measures placement must go through the Jump Start program with a Math faculty member.

**Faculty Updates**

Two Mathematics faculty members retired and only one was partially replaced with our new Engineering faculty member. The creation of our new Engineering program led us to hire and Engineering faculty member, Beth Flynn. We have been able to offer most of the courses for students to complete the degree. This academic year will be the first time offering ENGR P260 and P260L, the culminating courses for an Engineering degree at Porterville College.

Several new adjuncts were added to the schedule recently. Qualified math adjuncts are rare and difficult to find in our local area. The COVID-19 pandemic caused other colleges to reduce their course offerings and release adjunct from employment. At the same time, the Mathematics Division had faculty retire, leaving several unstaffed courses on our schedule. Together, these circumstances allowed for our division to hire displaced adjunct faculty and increase our adjunct pool. All of these adjuncts live outside of Porterville and drive, from as far as Fresno, to teach classes. It is important to note as other community colleges begin to see their enrollment trend upward, we may lose these adjunct faculty as they go back to previous employment closer to their homes.

***Report on Previous Goals***

|  |  |
| --- | --- |
| Goal | Status/Progress |
| 1. Develop an Engineering Lab | Revised: No progress has been made on this goal at this time. The COVID-19 pandemic forced courses to move online temporarily and limiting the number of employees on campus to complete such a project. We are requesting SM 101A and SM 101B become the designated spaces for Engineering/Physics labs. These rooms are close to area prep spaces and has a storage room/space to house Engineering equipment. Currently this equipment is stored in an empty office and the Engineering faculty office. The empty office will be used this coming year by the new Physical Science faculty hire.  New furniture will be required, storage shelves, and garage tables for the Programming courses in Engineering. |
| 2. Develop the second required math course for education majors. | Completed: Math P116 was created, proposed, and approved by the Curriculum Committee in Spring 2019. It can also be used to satisfy the additional math coursework required in the exemption process for a teaching credential. |
| 3. Implement a one-semester  pathway to calculus for entry-level STEM students. (Math 101AX) | Completed: Math P101A was created, proposed, and approved by the Curriculum Committee in Spring 2019. |
| 4. Create a math lab. | Completed: The creation of the STEM Center houses Math/Engineering tutors and a space for STEM students to work on innovative ideas.  In Progress: We are working on installing garage tables in several of the classroom spaces designated for Mathematics scheduling. Two weeks before the COVID-19 pandemic shutdown, Sherie Burgess, John Word, and Jay Navarette began discussions of how to implement and fund garage tables in SM 114 and SM 115. Not much planning has been done since this time as our focus has been on ensuring students have access to technology and services, leaving little time to discuss plans for the garage tables. |
| 5. Develop a MESA program. | In Progress: Funding is still an issue but have been working on self-funding the program to reduce costs to the district. With creation of the STEM Center, we hope this will be a space will serve as location for a MESA program. |
| 6. Develop an Associate of  Science degree in Engineering  Technology. | In Progress: The Engineering/Mathematics faculty member hired must split her time between the two discipline areas. COVID-19 has impacted the time available for curriculum development, as all our faculty needed to transition their courses to an online modality (leaving little time for anything else). |
| 7. Develop certificates of  achievement in the Engineering  and Engineering Technology  degrees. | In Progress: The Engineering/Mathematics faculty member hired must split her time between the two discipline areas. COVID-19 has impacted the time available for curriculum development, as all our faculty needed to transition their courses to an online modality (leaving little time for anything else). |
| 8. Expand the number of dual  Enrollment course offerings. | Completed: In 2016-17 there were two math sections offered as dual enrollment, which rose to five sections in 2020-21. It is important to note that we have three sections that are offered as concurrent enrollment at PHS, GHHS, and Lindsay HS. Currently, none of the high school faculty meet minimum qualifications to teach math at a community college. |
| 9. Work for a successful  Implementation of AB 705 and  respond as appropriate to  student performance data. | Completed: Our multiple measures placement guide is AB 705-compliant. Furthermore, our division has enabled more options for students to register directly into transfer-level courses than state guidelines suggest. Math faculty at Porterville College were one of the first in the state to fully implement AB 705 in the math discipline. |

***Program Strengths***

The Mathematics Division has received considerable recognition throughout the state, as well as nationally, for [contributing to student equity when it comes to enrolling in transfer-level math courses](https://collegecampaign.org/portfolio/getting-there/). Our division is committed to equity and has been identified as a “Strong Implementor” in allowing students the ability to fulfill their math requirement be enrolling directly into a transfer-level math course. Furthermore, Porterville College Math faculty have participated in numerous studies regarding our implementation of AB 705 and its success. Just Equations, CAPacity Gazette, PPIC (Public Policy Institute of California), and the RP Group are a few who have named Porterville College Math in publications. The PPIC researchers identified our college in 2019 with a [proportionality index for Latinx students as 0.98](https://www.ppic.org/wp-content/uploads/a-new-era-of-student-access-at-californias-community-colleges-november-2020.pdf) (out of 1.0). The proportionality index measures the extent to which different groups are equitably represented in student completion of math.

The following are additional program strengths identified by our division.

* Our division functions as a collaborative team, working together to ensure student success has been one of our greatest assets.
* One of our tenured faculty, Dustin Acres, successfully defended his dissertation on *Evaluating the Impact of AB 705 on Remediation: A Teacher's Perspective* and was awarded a Doctorate in Educational Leadership in May 2021.
* The implementation of new courses and co-requisites developed in response to AB 705 have been successful, allowing students to move through the mathematics sequences in less time.
* Ian Onizuka, along with one of the English faculty Melissa Long, presented *Putting the “Fun” Back in the Fundamentals: Corequisite Remediation without the Tears* at the CAP (California Acceleration Project) Annual Conference in February 2020.
* As a result of our work on multiple measures, Ian Onizuka also presented *BSTEM: How Does Corequisite Support Work in Open Access Transfer-Level BSTEM?* at the CAP Annual Conference in February 2020.
* The math multiple measures placement has been successfully implemented. Students are placed directly into transfer-level math with co-requisite support provided as needed and can work directly with a counselor to easily determine placement.
* Courses developed for education majors have seen increased enrollments each semester. Students are introduced to teaching Common Core Math, math pedagogies, situations regarding teaching Math, and how to coordinate Mathematics with other subject areas.
* The Engineering program is in the beginning stages of implementation and faculty are continually reevaluating course sequences to ensure timely graduation and success.
* The Math Jump Start program has been extremely successful in providing students a pathway to challenge their multiple measures placement.
* Ian Onizuka was a guest speaker for the Los Medanos flex day, presenting *Gamifying the Classroom* in Fall 2020.
* The 1st Annual Math Battle was held (virtually) with three local high schools in Spring 2021, providing a fun day for high school math competitors.
* Collaboration with MHS, PHS, and SCCA math faculty led to offering concurrent enrollment courses for students in statistics.
* Several courses have transitioned from physical and costly textbooks to e-texts with technology support, reducing the cost of materials to students.
* Several faculty members have transitioned their courses to ZTC (zero textbook cost).
* Abbe’ Reuter and Beth Flynn worked together to offer two week-long Engineering summer camps with hands-on projects. These camps were designed to encourage young females interested in engineering. One camp focused on middle school and one on high school students.

***Areas for Improvement***

The following are areas for improvement identified by our division.

* Although our success rates compare favorably with that of similar colleges, we are committed to increasing the success rates through co-requisite support, ongoing collaboration, and professional development opportunities.
* Finding local high school teachers to teach dual enrollment who also meet minimum qualifications for mathematics is a challenge.
* Our division generated 21.08 FTEF in 2020-21 with only seven full-time faculty members, suggesting the division could support at least two additional full-time faculty members.
* The FTES was 309.01 in 2019-20 and waitlists was 232, indicating our division could support two additional full-time faculty members with students still waitlisted on the first day of instruction.
* Increasing textbook costs are difficult on our students. We are working on solutions to mitigate these costs to our students.
* Additional Engineering concentrations need to be explored to aid in student transferability to four-year institutions.
* Development of Engineering certificates of achievement, such as Engineering Surveyors or CAD, to serve students seeking employment rather than graduating or transferring.
* The pool of available adjunct instructors in math is very small. It is a challenge to find individuals who meet minimum qualification and willing to teach part-time at Porterville College.
* Secure sustainable funding for the Math Battle competition, which draws local high school students to our STEM programs.
* Secure a space for Engineering courses to hold labs that do not overlap with current Physics and Calculus offerings.
* There is no MESA (Math, Engineering, and Science Achievement) program at Porterville College for assisting disadvantaged student populations in math, engineering, and computer science.
* Increase offerings of Math P115 and P116 without new faculty to teach them will be challenging. AB 130 allows more students to complete teacher credentialing with coursework to satisfy the basic skills and content knowledge requirements, rather than the CBEST and CSET. This will likely increase the number of students entering the Elementary Education pathway and increase the need for more of the Math P115/116 sections to be offered.

**Goals**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Goal(s) | Timeline for completion | Needed resources | Person(s) Responsible | Obstacles to completion (if any) | Mission Statement | Guided Pathways Pillars |
| 1. Investigate the feasibility of a B.S degree in Math Education | Spring 2024 | Replacement faculty | Division Chair, Dr. Sherie Burgess | Limits on the # of bachelor’s degrees CCC can offer | 1, 3, 4, 6 | 1, 2, 3, 4 |
| 2. Create opportunities for Math 115/116 students (Elementary Education majors) to work with local schools. | Spring 2025 | Faculty | Faculty teaching Math 115/116, NOYCE Scholarship Faculty | Conditional upon local elementary and middle school participation | 3, 4 | 2, 3 |
| 3. Offer more Math Jump Start sessions to assist student who want to challenge their multiple measures placement. | Fall 2025 | Faculty, funding for Summer and Winter sessions, classroom space, computers | Math Faculty | Securing consistent funding to offer more sessions is needed | 1, 2, 3, 4, 5, 6 | 1, 3, 4 |
| 4. Create an Engineering concentration to assist students in a clearer pathway to their specific field of Engineering. | Spring 2025 | Faculty, curriculum development funding | Engineering faculty, Beth Flynn  Division Chair, Dr. Sherie Burgess | Requires an Engineering lab space/classroom | 1, 3, 4, 6 | 1, 2, 3, 4 |

**Staffing:**

***Current Staffing Levels***

|  |  |  |  |
| --- | --- | --- | --- |
| Full-time | | Part-time | |
| Faculty | 7 | Faculty | 4 |
| Temporary | ~~0~~ | Temporary | ~~0~~ |
| Classified | 0 | Classified | 0 |
| Management | 0 | Management | 0 |

***Request for New/Replacement Staff***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Title of Position | Classification  (Faculty, Classified, or Management) | Full or Part  Time | New or Replacement |
| Position 1 | Mathematics, Tenure Track | Faculty | Full-Time | Replacement |
| Position 2 | Mathematics, Tenure Track | Faculty | Full-Time | New |
| Position 3 | Engineering Lab Technician | Classified | Part-Time | New |

Justification:

As noted earlier, waitlists for math classes have been consistently high. Every year there are hundreds of students on the first day waitlists because there are not enough faculty to teach more classes, suggesting that we are currently understaffed. We currently have one faculty member who teaches both Math and Engineering courses. Our Engineering program is quickly expanding with 52 uniquely enrolled students in 2020-21. As demand for Engineering increases, our faculty member will need to focus her load predominantly on Engineering, leaving the Math courses she currently teaches unstaffed. As the new Engineering program grows, additional STEM courses are needed to meet the increasing demand to avoid engineering students getting caught in a bottleneck of courses and not graduating in a timely manner.

As previously mentioned, the Elementary Education degree has also been growing significantly in recent years. We began offering two sections of these math courses, which has grown to six sections. New California legislation, AB 130, allows more students to complete their teacher credential without taking CBEST and CSET exams if other math courses satisfy the basic skills and subject matter competency requirements. This will likely increase the number of students entering the Elementary Education pathway and increase the need for more of the Math P115/116 sections to be offered. The state anticipates this will grow the teacher credential programs, ultimately allowing more students to successfully become credentialed. Students will enroll in additional math coursework to choose this more appealing option along their Elementary Education pathway. Increase offerings of Math P115 and P116 without new faculty to teach them will be challenging and our division will struggle to keep up with the student demand.

Mathematics is required for practically all majors. At our current staffing levels, students are forced to postpone their educational plans. Student equity is one of our main priorities and providing equal opportunities for students to enroll in necessary coursework to complete their degrees is essential to educational attainment. Thus, we are requesting an additional full-time Mathematics faculty position.

Our Engineering program is growing and as we create concentrations in the Engineering degree, a laboratory technician will be required. An Engineering laboratory technician will assist in the operation and maintenance of instructional laboratory equipment. The following are essential for a functional Engineering laboratory:

* Prepare laboratory activities and manage new/existing equipment (including electronics, soldering irons, chemicals, tensile strength machines, 3D printers and 3D scanners)
* Ensure laboratory operations are efficient and safe for students
* Support faculty and students in using electronic equipment, materials and supplies needed for a laboratory instructional setting
* Prepare instructional materials and equipment for classroom demonstrations
* Maintain records of materials and equipment utilized by students
* Ensure the laboratory environment is in safe, clean and working condition
* Maintain hazardous waste materials produced during laboratory experiments and arrange for proper disposal of any hazardous waste materials
* Order, receive, organize, store, and maintain supplies, materials, and equipment
* Maintain, adjust, clean, and perform minor repairs to equipment (if major repairs are required, arrange repairs as needed)
* Train and provide work direction to student workers

When faculty or students are tasked with laboratory technician duties, such as setting up and checking that equipment is in working condition (necessary for a functional lab course), this reduces instruction time. Asking students to perform these tasks during their lab time takes essential time away from learning and instruction necessary for becoming an Engineer. Thus, we plan to request a part-time Engineering lab technician.

**Resource Requests**

PROGRAM SUPPORT REQUEST

|  |  |
| --- | --- |
| Support Need | Justification |
| Faculty Advisor | Mathematics and Engineering students are required to enroll in course sequences depending on their intended career path. The concentrations under Math and Engineering are extensive and require knowledgeable discipline faculty with direct experience in the field(s) to ensure successful educational planning. |
| MESA | A MESA program would increase the success of our disadvantaged student populations in math and engineering. |
| Laboratory Technician | As the engineering program grows, the time required for faculty to prepare equipment and supplies for laboratories will grow. Currently the students and engineering faculty member prepares, sets up, takes down, and stores all equipment and supplies. A part-time lab tech will be required in the next couple of years. |
| Engineering Mentors | Currently, Beth Flynn has created a student engineering organization on campus. Using this student organization or adding another which would become a student chapter of a national engineering organization such as the SHPE (Society of Hispanic Professional Engineers), IEEE, ASCE, or SWE (Society of Women Engineers), could serve to mentor our students. Other possible resources could be STEM grants that bring engineering mentors to our students. |
| Cohort Model | Due to course offerings and sequencing of classes, Math and Engineering students often take the same set of classes each semester. We suggest a cohort be created and allow students to join this cohort, enrolling in the same 17 – 19 units each semester until completion. Students already self-select into the same classes and adding an offical cohort would streamline the process. This will build stronger relationships between students, leading to more connected and successful students. |
| Child Care Services | A number of students have identified childcare as an issue to attending classes. Available short-term and long-term childcare would provide time for students to focus on school obligations and improve outcomes for these students. |

TECHNOLOGY REQUEST

|  |  |
| --- | --- |
| Technology Need | Justification |
| Garage-tables (computers) for  SM-114, SM-115 | Both the Mathematics and Engineering programs are utilizing computer applications. There are few spaces available for scheduling courses needing technology. We currently use computer carts with laptops, but these become quickly outdated, slow, and need repair often. Furthermore, these carts have no storage space and reside in faculty offices to avoid theft. As carts are stored in specific faculty offices, they are not accessible to other faculty who need to use them for instruction.  Our current laptop computer carts must be moved in the rain leaving them susceptible to damage. Additionally, these carts are HEAVY and some of our disabled faculty are not able to push them. Scheduling classrooms in computer labs is possible at times, but computer rooms are not available on a regular basis. We request SM-114 and SM-115 be equipped with garage tables, similar to LIB-449 or LRC-512. This request was made two years ago, but the COVID-19 pandemic stalled discussions and garage tables have not yet been installed. |
| Engineering Lab in SM-101A and  SM-101B | Due to the size and nature of the engineering equipment, we request that SM-101A and SM-101B be converted into lab spaces. New furniture will need to be installed such as garage-tables with computers to facilitate programming courses for Engineering. |
| Computers with interactive software | Equip the classroom computers with interactive software that helps students to visualize and explore mathematical concepts. |
| Video/audio on computers in classrooms | As we consider recording classroom presentations or bringing in virtual speakers, the classroom computers and projectors currently do not have a web camera or microphone to facilitate two-way communication. |
| UTM (Universal  Testing Machine) | This is needed to accomplish concrete compression testing and tensile strength testing. |

FACILITIES REQUEST

|  |  |
| --- | --- |
| Facilities Need | Justification |
| Garage-tables (computers) for  SM-114, SM-115 | Both the Mathematics and Engineering programs are utilizing computer applications. There are few spaces available for scheduling courses needing technology. We currently use computer carts with laptops, but these become quickly outdated, slow, and need repair often. Furthermore, these carts have no storage space and reside in faculty offices to avoid theft. As carts are stored in specific faculty offices, they are not accessible to other faculty who need to use them for instruction.  Our current laptop computer carts must be moved in the rain leaving them susceptible to damage. Additionally, these carts are HEAVY and some of our disabled faculty are not able to push them. Scheduling classrooms in computer labs is possible at times, but computer rooms are not available on a regular basis. We request SM-114 and SM-115 be equipped with garage tables, similar to LIB-449 or LRC-512. This request was made two years ago, but the COVID-19 pandemic stalled discussions and garage tables have not yet been installed. |
| Engineering Lab in SM-101A and  SM-101B | Due to the size and nature of Engineering equipment, we request SM-101A and SM-101B be converted into lab spaces. The vault space will become storage for Engineering/Physics equipment. New furniture will need to be installed such as garage-tables with computers, instructor stations, tables with electrical outlets in the middle of the classroom, storage racks, and storage cabinets. |
| Storage room for computer carts and instructional equipment | Our laptop computer carts have no storage space and reside in faculty offices to avoid theft. As carts are stored in specific faculty offices, they are not accessible to other faculty who need to use them for instruction. |
| Adjunct Office | There is no office for Math adjunct faculty to utilize. Other divisions have dedicated spaces within their department’s vicinity for adjuncts needing to use a computer for instructional prep time or meeting with students outside of class. |

SAFETY & SECURITY REQUEST

|  |  |
| --- | --- |
| Safety & Security Need | Justification |
| Science and Math building filter | The past several years our community has dealt with disastrous fires. For weeks at a time, our air quality outside is hazardous. As people continually enter and exit the building, smoke gets trapped inside classroom and office spaces causing difficulties in breathing for some students and faculty. During the fire season of August and September 2021, the air quality index remained above 150 for several weeks. The current ventilation system in the SM building was not able to properly filter out smoke that had become trapped in our building, even days after the air quality index outside had lowered. Some faculty resorted to constructing a “home-made” box fan with four house filters to clean the inside air. We request the air filter be re-evaluated and replaced with a more efficient one to ensure students and staff are not subjected to breathing smokey air while working or in class. |

PROFESSIONAL DEVELOPMENT REQUEST

|  |  |
| --- | --- |
| Professional Development Need | Justification |
| Conference by NCSM | Experience ideas in Mathematics Leadership from other instructors of Mathematics. <https://www.mathedleadership.org/pl/54th-ncsm-annual-conference/> |
| NCTM Annual Meeting & Exposition Los Angeles | Learn new and improved methods to provide better mathematics instruction. <https://www.nctm.org/News-and-Calendar/Calendar-Events/NCTM/NCTM-Annual-Meeting-_-Exposition-Los-Angeles/> |
| International Conference on Mathematics Education and Technology | This international conference will highlight the connections between mathematics education and technology. Experiencing and understanding new technologies that will benefit students and instruction. <https://waset.org/mathematics-education-and-technology-conference-in-september-2022-in-san-francisco> |
| MAA MathFest | The leading mathematics organization provides an opportunity every summer to present the latest in mathematics research and education. <https://www.maa.org/meetings/mathfest> |
| Annual AMTE Conference | The association of Mathematics Teacher Educators focuses their efforts on the teaching of mathematics teachers. <https://amte.net/content/2022-annual-amte-conference> |
| ICME-15 (2024) | The International Commission on Mathematical Instruction meets every four years to showcase research, techniques, understandings of a variety of issues regarding instruction of mathematics. <https://www.mathunion.org/icmi/icme-15-2024> |
| US Math Recovery Conference | Math Recovery is a process developed by a math instructor that uses a technique valuable to students with the goal of becoming a teacher. <https://www.mathrecovery.org/2022-national-conference> |
| IEEE Integrated STEM Education Conference | Professional development focused on an integration of STEM fields with education. <https://ewh.ieee.org/conf/stem/> |
| National Mathematics Summit | National Organization for Student Success presents a variety of topics in teaching mathematics including: using OER for college classes; promoting meaningful student collaborations; and teaching math for equity. <https://thenoss.org/Math-Summit> |
| ASCE Convention | Expand our professional experiences and knowledge. <https://convention.asce.org/> |
| SHPE Convention | Increase awareness of educational opportunities for Hispanic engineers. <https://www.shpe.org/events/nc2021> |
| NSPE Convention | Preparing for future developments in the Engineering field with specialized content from experts discussing issues and trends impacting the profession. <https://www.nspe.org/resources/2022-professional-engineers-conference> |

**Budget**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Current Budget | Amount of Change | Revised Total |
| 2000 (Student Workers Only) |  |  |  |
| 4000 | $6500 | 0 | $6500 |
| 5000 |  |  |  |
| Other |  | $60,000 | $60,000 |

Justification:

As noted above, as we expand our Engineering program to include specific concentrations such as Mechanical Engineering, Electrical Engineering, Civil Engineering, etc. a Universal Testing Machine (UTM) will be needed to offer functional labs and instruction for these Engineering fields.