# STEM Center Program Review
## A. Program Information
### Program Mission Statement

1. Please enter your mission statement here.

> The STEM center is dedicated to student success, equity and retention in STEM classes as well as all classes across the campus where STEM concepts are found. We not only support course-level academic needs of students from all backgrounds, but also help students build skills for college success, enjoy a sense of belonging at Foothill and within STEM, and make real-world connections with the concepts they are learning in class. We see students develop as independent, critical thinkers and lifelong learners. We provide a safe and welcoming space for all students to thrive. We recognize that students place their trust in us, and we cherish that trust.

### Program Level Student Area Outcomes

2. Please list the program-level student area outcomes.

- Usage rates of the STEM Center by under-represented sub-groups are at least as high as their overall demographic representation at Foothill College.
- Foothill Connect student referrals accessing STEM Center services will increase over time.
- Frequent use of the STEM Center leads to higher course success.

## B. STEM Center Usage Rates Mirrors the College

The chart below shows the rate of STEM Center usage by select student groups by quarter for 2017-18.

|  | Fall | Winter | Spring |
|---|---|---|---|
| Black | 4%, 71 | 4%, 68 | 4%, 64 |
| Latinx | 25%, 441 | 25%, 426 | 24%, 384 |
| Native American | 0%, 0 | 0%, 0 | 1%, 16 |
| Filipinx | 5%, 88 | 4%, 68 | 4%, 64 |
| Pacific Islander | 1%, 18 | 1%, 17 | 1%, 16 |
| Disability Resource Center | 6%, 106 | 6%, 102 | 5%, 80 |
| Veterans Resource Center | 2%, 35 | 2%, 34 | 2%, 32 |

The chart below shows the rate of STEM Center usage by select student groups by quarter for 2018-19.

|  | Fall | Winter | Spring |
|---|---|---|---|
| Black | 4%, 64 | 4%, 46 | 3%, 31 |
| Latinx | 28%, 450 | 20%, 228 | 21%, 218 |
| Native American | 0%, 0 | 0%, 0 | 0%, 0 |
| Filipinx | 4%, 64 | 3%, 34 | 3%, 31 |
| Pacific Islander | 1%, 16 | 0%, 0 | 1%, 10 |
| Disability Resource Center | 6%, 96 | 6%, 68 | 5%, 52 |
| Veterans Resource Center | 2%, 32 | 2%, 23 | 2%, 21 |

The chart below shows the rate of STEM Center usage by select student groups by quarter for 2019-20.

|  | Fall | Winter | Spring |
|---|---|---|---|
| Black | 4%, 32 | 3%, 26 | N/A |
| Latinx | 22%, 177 | 28%, 241 | N/A |
| Native American | 0%, 0 | 0%, 0 | N/A |
| Filipinx | 4%, 32 | 4%, 34 | N/A |
| Pacific Islander | 2%, 16 | 1%, 9 | N/A |
| Disability Resource Center | 11%, 89 | 11%, 95 | N/A |
| Veterans Resource Center | 2%, 16 | 2%, 17 | N/A |

The chart below shows the rate of STEM Center usage by select student groups by quarter for 2020-21.

|  | Fall | Winter | Spring |
|---|---|---|---|
| Black | 5%, 30 | 5%, 35 | 7%, 38 |
| Latinx | 27%, 162 | 26%, 180 | 22%, 119 |
| Native American | 1%, 6 | 1%, 7 | 1%, 5 |
| Filipinx | 2%, 12 | 5%, 35 | 3%, 16 |
| Pacific Islander | 2%, 12 | 1%, 7 | 1%, 5 |
| Disability Resource Center | 9%, 54 | 8%, 56 | 8%, 43 |
| Veterans Resource Center | 3%, 18 | 3%, 21 | 3%, 16 |

The chart below shows the rate of STEM Center usage by select student groups by quarter for 2021-22.

| | Fall | Winter | Spring |
|---|---|---|---|
| Black | 6%, 29 | 6%, 23 | 6%, 27 |
| Latinx | 31%, 149 | 25%, 96 | 21%, 94 |
| Native American | 0%, 0 | 1%, 4 | 0%, 0 |
| Filipinx | 3%, 14 | 4%, 15 | 2%, 9 |
| Pacific Islander | 1%, 5 | 0%, 0 | 1%, 4 |
| Disability Resource Center | 10%, 48 | 13%, 50 | 15%, 67 |
| Veterans Resource Center | 3%, 14 | 3%, 11 | 3%, 13 |

3. What do you observe in the data? What do you want the college to understand about your program and the data?

At the top level, we can take pride in these numbers. In each area where the college shows disproportionate impact, the STEM center served an equal or larger percentage of students each year than the college as a whole. Our percentage of VRC and DRC students is two to three times the college as a whole, This is a success, as it suggests that we are helping to close the equity gap, rather than serving only students who know how to do college or would succeed with or without our assistance. Digging deeper, we generally see a decrease of Latinx students as each year goes on that appears significant and cannot be ignored. Campus demographics do not show a similar trend. This suggests that Latinx students are willing to try our services in disproportionate numbers, but that they do not find enough value to come back in future quarters.

4. Describe the proposed actions or next steps to maintain or improve the data by student group.

We will work with IR to look closely at our Latinx students, especially those who visit and do not return, to learn about their experience with the STEM Center and our tutors. We will work with the office of equity and with professional development to explore whether there are biases present that may make our center less welcoming to Latinx students. We will work with our new MESA program, which is physically located next to the STEM Center, to make sure their students are aware of the services that we offer.

5. What does your program need to execute this action plan?

1. Access to IR to survey Latinx students.
2. Funding for outreach activities (pizza parties with MESA and Puente, for example).
3. Regular engagement with each student community, especially those who serve Latinx students.

## C. Foothill Connect student referrals accessing STEM Center

The chart below shows the rate of Foothill Connect referrals accessing the STEM Center in 2017-18.

| | Fall | Winter | Spring |
|---|---|---|---|
| Foothill Connect Referrals | 47%, 57 | 28%, 53 | 30%, 44 |

The chart below shows the rate of Foothill Connect referrals accessing the STEM Center in 2018-19.

| | Fall | Winter | Spring |
|---|---|---|---|
| Foothill Connect Referrals | 37%, 88 | 20%, 27 | 15%, 40 |

The chart below shows the rate of Foothill Connect referrals accessing the STEM Center in 2019-20.

| | Fall | Winter | Spring |
|---|---|---|---|
| Foothill Connect Referrals | 8%, 26 | 20%, 37 | N/A (No data) |

The chart below shows the rate of Foothill Connect referrals accessing the STEM Center in 2020-21.

| | Fall | Winter | Spring |
|---|---|---|---|
| Foothill Connect Referrals | 8%, 15 | 7%, 18 | 7%, 9 |

The chart below shows the rate of Foothill Connect referrals accessing the STEM Center in 2021-22.

| | Fall | Winter | Spring |
|---|---|---|---|
| Foothill Connect Referrals | 17%, 28 | 9%, 11 | 31%, 19 |

6. What do you observe in the data? What do you want the college to understand about your program and the data?

We observe that about 20% of students flagged as needing STEM help by Foothill Connect actually visit the STEM Center.

From Fall 2017 through Fall 2018 we employed a recent Foothill graduate as a TEA. Among other outreach duties, she would respond to referrals that came through Starfish. The student would reach out directly and

personally to students several times to encourage them the visit the STEM Center, and then reach out after a student visit to check on the experience, ask for feedback, and encourage the student to return. Finally, the employee would close the loop to let the instructor know what services were provided. The data show that this activity was effective, and our conversion rate and number of students served have both decreased since we discontinued the activity

| Year | Quarter | Flagged students | Flagged students visiting STEM Center | % |
|------|---------|------------------|---------------------------------------|---|
| 2017 | Fall | 122 | 57 | 47 |
| 2018 | Winter | 187 | 53 | 28 |
| 2018 | Spring | 149 | 44 | 30 |
| 2018 | Fall | 237 | 88 | 37 |
| 2019 | Winter | 132 | 27 | 20 |
| 2019 | Spring | 262 | 40 | 15 |
| 2019 | Fall | 336 | 26 | 8 |
| 2020 | Winter | 185 | 37 | 20 |
| 2020 | Spring | N/A | N/A | |
| 2020 | Fall | 194 | 15 | 8 |
| 2021 | Winter | 247 | 18 | 7 |
| 2021 | Spring | 134 | 9 | 9 |
| 2021 | Fall | 161 | 28 | 17 |
| 2022 | Winter | 117 | 11 | 9 |
| 2022 | Spring | 62 | 19 | 31 |

7. Describe the proposed actions or next steps to maintain or improve the data.

1. Monitor referrals and percentage of students who visit the center on a quarterly basis or more often to ensure that we are making progress and react as necessary
2. Closer collaboration with Instructors:
    1. Encourage instructors to complete Foothill Connect surveys
    2. Hold STEM Center open house for instructors
3. Hire a student worker or TEA to handle Foothill Connect referrals.

8. What does your program need to execute this action plan?

Funding to hire a student worker or TEA.

## D. Frequent use of the STEM Center leads to higher course success.
The chart below shows the rate of course success for students visiting the STEM Center more than once.

| | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---------|---------|---------|---------|---------|
| Success | 82%, 1,707 | 82%, 1,152 | 84%, 586 | 87%, 411 | 85%, 510 |
| Non Success | 10%, 208 | 10%, 141 | 7%, 49 | 5%, 23 | 7%, 42 |
| Withdrew | 8%, 167 | 8%, 112 | 9%, 8 | 8%, 38 | 8%, 48 |
| Total | 100%, 2,082 | 100%, 1,405 | 100%, 698 | 100%, 473 | 100%, 600 |

The chart below shows the rate of course success for students who visit the STEM Center once.

| | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---------|---------|---------|---------|---------|
| Success | 81%, 799 | 80%, 792 | 83%, 479 | 85%, 699 | 84%, 281 |
| Non Success | 10%, 99 | 11%, 109 | 9%, 52 | 6%, 49 | 7%, 23 |
| Withdrew | 8%, 79 | 9%, 89 | 9%, 52 | 9%, 74 | 9%, 30 |
| Total | 100%, 976 | 100%, 990 | 100%, 577 | 100%, 822 | 100%, 334 |

9. What do you observe in the data? What do you want the college to understand about your program?

Students who visit the STEM Center more than once show a success rate of one to six points higher than the overall campus population.  As we dig deeper, we find that this benefit holds true for each disproportionately impacted subgroup, including(for 2021-22) Black +11pts., Latinx +3 pts., Pacific Islander +31 pts. (low n), Female +4 pts., DRC +1pt, VRC +4pts. While it is difficult to rule out selection bias in a tutoring center, the breadth of differential success suggests that our service is having a great impact. Again the fact that Latinx students see a lower benefit than other ethnic subgroups jumps out as a red flag.

10. Describe the proposed actions or next steps to maintain or improve the data by student group.

1. Share these results with faculty and students in an effort to encourage even more participation from disproportionately impacted subgroups.
2. Work with STEM instructors to create added value for students visiting the STEM center.  For example, re-energize the test corrections program
3. Encourage STEM Instructors to hold office hours in the STEM Center, both in-person on-campus and virtually on LRC Online
4. As mentioned above, work with IR, the office of equity, and professional development to learn how we can improve the service that we offer to Latinx students.
5. Survey faculty tutors regularly both to elicit suggestions and to keep the message active that we must provide a welcoming environment to all students and we must not lose the Latinx population.
6. Frequent training and observation of the host and front desk teams to ensure that we are providing a warm welcome to students.

11. What does your program need to execute this action plan?

Support from IR, office of equity and professional development.

## E. Service Area Objective Addendum

1. What are the service area outcomes & strategic objectives for the coming year?

Based on a the program review process, we see three major opportunities where we can make headway in the short term and beyond:

1. By 2024-25, we would like to see Latinx students represent at least 26% of STEM Center users in all three quarters.
2. By 2024-25, we would like to see at least 25% of Foothill Connect referrals converted to STEM Center visits.
3. By Spring 2024, we would like the STEM Center to offer services until 9PM Monday - Thursday, and from 11AM-5PM on Saturdays.

We believe that focusing on these three objectives in the short term will support our Program Level Outcomes in the long term.

While our changed mix of services online vs. face-to-face may prevent us from ever returning to the attendance levels that we saw in 2017-18, we believe that with some additional support mentioned throughout this plan we can increase attendance year over year for the next several years.  This is based on activities that have been proven effective in the past. And we establish that as a fourth objective:

4. Increase FTES by 10%+ for each of the next three years.

2. What is your implementation plan for the above-mentioned objectives?

1. In winter 2024, work with MESA, equity, and professional development to look carefully at the annual loss of Latinx visitors to the STEM center and develop a plan to better support these students. We don't want to presuppose the outcome of this work, other than that we anticipate developing a strategy that can be executed no later then Fall 2024.

2. Hire a student worker or recent graduate to contact and track all students referred through Foothill Connect. As in the past, this employee will not only work with Foothill Connect, but also with cohorts like Umoja, Puente and MESA, and with departments such as Kinesiology (specifically, athletics) and Geography.
3. Schedule instructors starting in Spring 2024

3. What barriers has the program faced in implementing improvements?

1. There are no barriers to this work other than the bandwidth of the staff and faculty involved.
2. Funding, and in the case of a recent graduate hire, the ability to hire a TEA.
3. Funding, this would require 1.4 additional FTEF

## F. Enrollment Trends: NCBS 405
### a. FTES

|  | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|---|
| FTES | 180 | 125 | 55 | 29 | 17 |

1. What do you observe in the data above in relation to your goals? What do you want the college to understand about the FTES in your program?

Declining enrollment is discouraging and does not meet our goal of reaching more students, especially underrepresented students. We understand the reasons for the drop, as highlighted in item b.

STEM Center FTES is sensitive to the mix of face-to-face vs online use of services. While a student is in the Center using resources and supervised by faculty, we report attendance. Online, we only report the time the student actively spends with faculty. Tutoring online tends to be one-on-one. In person, tutors often pull students together into impromptu workshops.

2020-21 and 2021-22 attendance is underreported. Aside from the pandemic effect on the type of service we offer, we have experienced shifts in staff responsibility around gathering and reporting attendance. That enrollment is reported down 18% from 2019-20 to 2021-22 but FTES is off by 69% supports this belief.

Continued deterioration of the 4200 building and its systems makes the center less comfortable for students.

2. What actions does your program plan to take?

Reliable data is important to understand and improve our level of service, and low reported FTES puts our program in jeopardy. In December the WLC and STEM Center staff will meet to establish and test procedures for collecting and reporting reliable student attendance.

We also need to look at patterns of use on-campus, and see how we might provide analogous experiences online. Could we, for instance, develop online study groups in Zoom that are facilitated by our faculty tutors?

We need to move on Measure G funding available to update our building.

3. What does your program need to execute this action plan?

Continued ETS assistance to be sure that we have systems in place to capture and report accurate attendance data.

Movement to use the $2.753,300 allocated to the STEM Center and WLC to update the 4200 building with functioning HVAC and purpose-built spaces for student support.

### b. Enrollment

|  | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|---|
| Enrollment | 5244 | 3899 | 1878 | 2013 | 1532 |

4. What do you observe in the data above in relation to your goals? What do you want the college to understand about the enrollment in your program?

Pre-pandemic, STEM center enrollment dropped precipitously from 2017-18 to 2018-19. This coincides with three significant changes in the operation of the center.

- Funding was cut by approximately 50%. We curtailed morning, evening, Friday and Saturday service. This reduced the number of hours that students could access the center, but also the "always available" image. Some students who had made the STEM Center their home now to study in a location that stays open beyond the school day.
- We discontinued two programs that helped students become familiar with the center. First, supplemental instructors embedded in foundational math classes. Second, a "test corrections" program that worked with classroom instructors to encourage students to seek help in the STEM Center.
- We shifted from having a full-time STEM Center Director, to program coordinators coordinating the day-to-day activities with oversight from an administrator. It is possible that we lost a sense of ownership and vision through this transition.

5. What actions does your program plan to take?

We believe that we can serve our equity goals by providing service across a greater number of hours. We propose staying open with a light tutoring staff until 9pm Monday through Thursday, opening on Saturday from 11am-5pm, and providing additional hours over the weekend before finals.

While the test corrections program was resource intensive, we believe that we can bring it back in a targeted way, offering test or quiz correction services for the first assessment in a class, so students can get a taste of the type of service they can expect.

6. What does your program need to execute this action plan?

Load to support extended hours with two faculty present, 32 person-hours per week, plus addition finals week hours, a total of 1.4 annual part-time FTEF.

## G. Enrollment by Student Demographics: NCBS 405
### a. By Gender

|  | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|---|
| Female | 48%, 2,517 | 44%, 1,716 | 47%, 883 | 53%, 1,067 | 46%, 705 |
| Male | 51%, 2,674 | 55%, 2,144 | 52%, 977 | 45%, 906 | 52%, 797 |
| Non--binary | 0%, 0 | 0%, 0 | 0%, 0 | 0%, 0 | 0%, 0 |
| Unknown Gender | 1%, 52 | 1%, 39 | 1%, 18 | 1%, 20 | 1%, 15 |
| Total | 100%, 5,224 | 100%, 3,899 | 100%, 1,878 | 100%, 2,013 | 100%, 1,532 |

7. What do you observe in the data above in relation to your goals? What do you want the college to understand about enrollment by gender in your program?

We observe that across the five year span, female students are significantly underrepresented in the STEM center as compared to the college as a whole (53% female, 46% male), and the STEM division in particular (50% female, 48% male). One year, 2020-21 tells a dramatically different story. During 2020-21 we were only offering STEM Center services online, which could indicate that our services are more accessible to female students online than in-person.

8. What actions does your program plan to take?

We will work with IR to survey female students and try to determine how we can better meet their needs. We would not want to presuppose an answer, but we should explore whether the online modality is more accessible for female students. We do offer all of our services online whenever the STEM center is open, so a solution may simply be to make sure female students are aware of that offering.

9. What does your program need to execute this action plan?

Access to IR to survey female students

Access to marketing to make sure all students, and female students in particular, are aware that significant online academic support is available from the STEM Center.

## b. By Ethnicity

|  | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|---|
| Asian | 39%, 2,045 | 42%, 1,638 | 36%, 676 | 30%, 604 | 37%, 567 |
| Black | 4%, 210 | 4%, 156 | 3%, 56 | 4%, 81 | 3%, 46 |
| Filipinx | 5%, 262 | 4%, 156 | 4%, 75 | 4%, 81 | 3%, 46 |
| Latinx | 25%, 1,311 | 24%, 936 | 30%, 563 | 30%, 604 | 28%, 429 |
| Native American | 1%, 52 | 0%, 0 | 0%, 0 | 1%, 20 | 0%, 0 |
| Pacific Islander | 1%, 52 | 1%, 39 | 1%, 19 | 1%, 20 | 1%, 15 |
| Unknown Ethnicity | 3%, 157 | 2%, 78 | 2%, 38 | 3%, 60 | 4%, 61 |
| White | 22%, 1,154 | 24%, 936 | 23%, 432 | 27%, 544 | 22%, 337 |
| Total | 100%, 5,244 | 100%, 3,899 | 100%, 1,878 | 100%, 2013 | 100%, 1,532 |

10. What do you observe in the data above in relation to your goals? What do you want the college to understand about enrollment by ethnicity in your program?

At the top level, we can take pride in these numbers. In each area where the college shows disproportionate impact, the STEM center served an equal or larger percentage of students each year than the college as a whole. Our percentage of VRC and DRC students is approximately three times the college as a whole, This is a success, as it suggests that we are helping to close the equity gap, rather than serving only students who know how to do college or would succeed with or without our assistance. Digging deeper, we generally see a decrease of Latinx students as each year goes on that appears significant and cannot be ignored. Campus demographics do not show a similar trend. This suggests that Latinx students are willing to try our services in disproportionate numbers, but that they do not find enough value to come back in future quarters.

11. What actions does your program plan to take?

We will work with IR to look closely at our Latinx students, especially those who visit and do not return, to learn about their experience with the STEM Center and our tutors. We will work with the office of equity to explore whether there are biases present that may make our center less welcoming to Latinx students. We will work with our new MESA program, which is physically located next to the STEM Center, to make sure their students are aware of the services that we offer.

12. What does your program need to execute this action plan?

1. Access to IR to survey Latinx students.
2. Funding for outreach activities (pizza parties with MESA and Puente, for example).
3. Regular engagement with each student community, especially those who serve Latinx students.

## H. Summary

Use this opportunity to reflect on your discussions above and include any closing thoughts.

We have a solid plan for improvement that should result in a measurable impact on our students. We honestly appreciate the "forced opportunity" to dig into our data. Without this focused time we would move forward, putting out fires, but without recognizing the opportunities to take targeted and intentional actions that are likely to help us better achieve our equity mission.

The exciting bit about the STEM Center is that we have an institutional memory of what has worked in the past. With a fairly small additional investment in the service we know that we can create a showcase system of support that works to identify students who need support in real time, and then offer them the help that they need.

We have an internal plan to make progress.  We also need campus and district support to spend the Measure G money that has been allocated to update the 4200 building, to support extended hours so the students can see the STEM Center as their study home, and to fund an outreach employee to work with Foothill Connect and other groups on campus.

## I. Rubric

Click on the link below to view the STEM Center Rubric.

https://foothilldeanza-my.sharepoint.com/:w:/g/personal/20078222_fhda_edu/EdNu76tFkkdBj3pDe4nm98EB8wEFqrOaQOWqMvLirxI0Ew?e=fIUQTK

This form is completed and ready for acceptance.