



Fullerton College

Self-study for Chemistry Program

2025

Section 1: Introduction

1. Briefly describe your program, make sure to include how your program helps the College achieve its mission.

The Chemistry Department in the Division of Natural Sciences is an integral part of Fullerton College and shares in Fullerton College's mission to advance student learning and achievement and is dedicated towards promoting excellence in learning. The Chemistry Department acknowledges that students from our diverse communities have various academic and career goals and, therefore, offers courses to meet general education requirements and to transfer to a four-year institution or professional school as chemistry, pre-health, or STEM (science, technology, engineering, and math) majors. Furthermore, the Chemistry Department promotes opportunities that allow students to participate in the learning community at Fullerton College and to engage members of the scientific community.

The faculty members of the Chemistry Department foster a welcoming and inclusive learning

environment in the classroom that empowers its students through active learning strategies that support critical thinking. The faculty members of the Chemistry Department strive to create a community that welcomes diverse perspectives while supporting individual students. The students in our courses are encouraged to be involved in scientific engagement both inside and outside the classroom, while the faculty members facilitate meaningful interactions and support both the growth and development of the students and the department. The faculty members of the Chemistry Department have created a community that promotes inquiry and intellectual curiosity, personal growth, and a life-long appreciation for the power of learning that can transform lives and inspire a positive change in the world.

Section 2: Students

2.1 Student Demographics and Enrollment Trends

1. Using the data provided by the OIE, describe the student population your department serves. Which demographic groups have the most enrollments in your program? Which student groups are underrepresented in your program? Has the demographic profile of your program changed over the last four years?

Table 1 shows the number of enrollments (headcount) enrolling each academic year in the Chemistry Program based on gender. The total number of enrollments (headcount) showed a marked drop off (an 11.8% drop) after the 2020-2021 academic year into the 2021-2022 academic year but has since stabilized. This enrollment trend is consistent with what was observed across the entire campus because of the Covid-19 pandemic (See Table 2). Fullerton College experienced a 14.2% drop in enrollment during the same period.

As of the 2024-2025 academic year, enrollment in the Chemistry Program was still 1.7% lower relative to the 2021-2022 academic year, which means that enrollment has yet to recover from the pandemic drop. In contrast, enrollment for the entire college has increased by 10.4% during the same period. An objective conclusion here would be that while enrollment has been recovering from the pandemic drop for the campus, it has yet to recover for the chemistry program (although classes for this current fall 2025 semester were at capacity with fuller waitlists than in recent semesters).

Table 1. Head Count in the Chemistry Program Based on Gender from the 2020-2021

through 2024-2025 academic years.

Academic Year Gender	2020-2021		2021-2022		2022-2023		2023-2024		2024-2025		Total	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Female	1010	55.86%	872	54.67%	744	51.35%	821	54.08%	846	54.09%	3443	54.72%
Male	718	39.71%	641	40.19%	620	42.79%	601	39.59%	627	40.09%	2512	39.92%
Unknown	80	4.42%	82	5.14%	85	5.87%	96	6.32%	91	5.82%	337	5.36%
Total	1808	100.00%	1595	100.00%	1449	100.00%	1518	100.00%	1564	100.00%	6292	100.00%

Table 2. Head Count for all of Fullerton College Based on Gender from the 2020-2021 through 2024-2025 academic years.

Academic Year Gender	2020-2021		2021-2022		2022-2023		2023-2024		2024-2025		Total	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Female	16147	52.94%	13532	51.72%	13502	51.08%	13669	50.82%	14533	50.31%	41432	51.47%
Male	12799	41.96%	11107	42.45%	11368	43.01%	11457	42.59%	12037	41.67%	33956	42.19%
Unknown	1554	5.10%	1526	5.83%	1561	5.91%	1773	6.59%	2337	8.09%	5123	6.36%
Total	30500	100.00%	26165	100.00%	26431	100.00%	26899	100.00%	28889	100.00%	80491	100.00%

Interestingly, a significant majority of headcount enrollment within the Chemistry Department was comprised of women (56% vs. 40% for men) during the 2020-2021 academic year. This disparity has remained consistent as of the 2024-2025 academic year (54% women vs. 40% men). A similar trend is observed for the entire campus, but to a slightly lesser extent with women outnumbering men by a 53% to 42% margin in 2020-2021. This enrollment gap has closed somewhat since then to 50% women vs. 42% men for the 2024-2025 academic year.

Table 3 shows the number of enrollments (headcount) enrolling each academic year in the Chemistry Program based on ethnicity. According to Table 3, a majority of the enrollment within the Chemistry Department is due to students who identify as Latina/o/x/e. In fact, enrollment by Latina/o/x/e students in Chemistry coursework has increased from 51% to 57% over the last four years, which is now virtually identical to the 58% Latina/o/x/e enrollment makeup for the entire college (see Table 4) as of this past academic year. Four years ago, Latina/o/x/e students comprised 56% of the total enrollment for the college. Thus, the rate of increase of Latina/o/x/e representation in the Chemistry Department (+11.8%) has outpaced the rate of increase of Latina/o/x/e students for the whole college (+3.6%) over the same period.

Table 3. Head Count in the Chemistry Program Based on Ethnicity from the 2020-2021 through 2024-2025 academic years.

Academic Year Ethnicity	2020-2021		2021-2022		2022-2023		2023-2024		2024-2025		Total	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
American Indian or Alaska Native	2	0.12%									2	0.03%
Asian	419	24.65%	351	23.60%	254	18.73%	250	17.57%	271	18.68%	1235	21.06%
Black or African American	3	0.18%	1	0.07%	2	0.15%	1	0.07%	1	0.07%	5	0.09%
Latina/o/x/e	868	51.06%	802	53.93%	761	56.12%	810	56.92%	828	57.06%	3173	54.10%
Native Hawaiian or Other Pacific Islander	4	0.24%	3	0.20%	1	0.07%	2	0.14%	4	0.28%	12	0.20%
Two or more races	129	7.59%	120	8.07%	145	10.69%	147	10.33%	156	10.75%	568	9.68%
Unknown	32	1.88%	20	1.34%	28	2.06%	28	1.97%	30	2.07%	112	1.91%
White	243	14.29%	190	12.78%	165	12.17%	185	13.00%	161	11.10%	758	12.92%
Total	1700	100.00%	1487	100.00%	1356	100.00%	1423	100.00%	1451	100.00%	5865	100.00%

Table 4. Head Count for all of Fullerton College Based on Ethnicity from the 2020-2021 through 2024-2025 academic years.

Academic Year Ethnicity	2020-2021		2021-2022		2022-2023		2023-2024		2024-2025		Total	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
American Indian or Alaska Native	9	0.03%	4	0.02%	1	0.00%	1	0.00%	1	0.00%	10	0.01%
Asian	4414	15.76%	3735	15.58%	3374	14.00%	3516	14.40%	3688	14.05%	11574	15.80%
Black or African American	70	0.25%	47	0.20%	26	0.11%	15	0.06%	9	0.03%	103	0.14%
Latina/o/x/e	16124	57.56%	13771	57.46%	13880	57.60%	14502	59.41%	15737	59.94%	41194	56.24%
Native Hawaiian or Other Pacific Islander	66	0.24%	44	0.18%	54	0.22%	60	0.25%	66	0.25%	189	0.26%
Two or more races	1825	6.51%	1730	7.22%	1754	7.28%	1919	7.86%	2141	8.15%	5519	7.53%
Unknown	561	2.00%	430	1.79%	541	2.24%	440	1.80%	541	2.06%	1650	2.25%
White	4945	17.65%	4206	17.55%	4469	18.54%	3956	16.21%	4074	15.52%	13015	17.77%
Total	28014	100.00%	23967	100.00%	24099	100.00%	24409	100.00%	26256	100.00%	73253	100.00%

To discuss which (if any) demographic groups are underrepresented in the Chemistry Department, it is helpful to define a benchmark as to what “underrepresentation” means. In the context of this program review, underrepresentation will be defined as representation of a demographic group in the chemistry program relative to the campus representation as a whole. Given this benchmark, it would seem that men are somewhat underrepresented in the Chemistry Program headcount enrollment (54% women vs. 40% for men; a 14% gap) relative to the entire campus (50% women vs. 42% for men; an 8% gap) as of the 2024-2025 academic year.

In regard to ethnicity, the percentage of headcount enrollment belonging to any one ethnic group is virtually identical between the Chemistry Department and the entire college. A slight exception to this consistency may pertain to White students (10% for Chemistry vs. 14% for

the campus) as of the 2024-2025 academic year. Other historically underrepresented groups such as Latina/o/x/e (57% for Chemistry vs. 58% for the college) or Black or African American (2% for Chemistry vs. 3% for the college) show similar enrollment percentages between the Chemistry Department and the entire college.

The demographics of the student body within the Chemistry Department have only marginally changed over the last four years. Enrollment for Asian students has dropped from 23% to 17%, while enrollment headcount has increased from 51% to 57% for Latina/o/x/e students. Enrollment for students of two or more races has increased slightly from 8% to 11% while enrollment for White students has declined slightly from 13% down to 10% during the 2020-2025 academic period.

2. Briefly describe course-level enrollment trends in your program over the past five years. Have the enrollment trends in your program changed over the last five years? To what do you attribute any changes or lack of changes?

The Chemistry Department offers a variety of courses depending on student needs. These courses include CHEM 100 (chemistry for non-majors that includes a lab component), CHEM 103 (chemistry for non-majors without a lab component), CHEM 101 (chemistry for allied health majors), CHEM 201 (biochemistry for allied health majors), CHEM 107 (introductory chemistry for STEM majors), CHEM 111A (general chemistry for STEM majors part I), CHEM 111B (general chemistry for STEM majors part II), CHEM 211A (organic chemistry for STEM majors part I), and CHEM 211B (organic chemistry for STEM majors part II). Table 5 shows the headcount enrollment for each of these courses from the 2020-2021 to 2024-2025 academic years.

Table 5. Total course-level headcount enrollment from the 2020-2021 through 2024-2025 academic years.

Student Major Type	Academic Year	2020 - 2021	2021 - 2022	2022 - 2023	2023 - 2024	2024 - 2025
Gen. Ed. Requirement	CHEM 100	172	165	158	158	162
	CHEM 103	62	39	53	86	91

Health Sciences	CHEM 101	286	303	308	360	350
	CHEM 201	80	59	21	23	19
STEM Majors	CHEM 107	623	573	516	474	507
	CHEM 111A	454	381	330	337	397
	CHEM 111B	258	217	191	185	185
	CHEM 211A	115	79	76	72	76
	CHEM 211B	77	57	32	38	38

A graphical snapshot of Table 5 is shown in Figure 1. As can be seen in both Table 5 and Figure 1, the courses with the highest demand are CHEM 101, CHEM 107 and CHEM 111A. All three of these courses are gateway courses for a variety of majors. For CHEM 101, this is specifically needed by students majoring in the health fields (nursing in particular). On the other hand, CHEM 107 and CHEM 111A are entry chemistry courses needed for all STEM majors including biology, engineering, physics and other pre-medical field career paths. Thus, it makes sense these are the highest demand courses. In particular, CHEM 107 has the highest demand because most STEM majors need more preparation before they are ready to succeed in general chemistry (CHEM 111A).

[Link to Figure 1](#)

Figure 1. Course-level enrollments by academic year from 2020 – 2021 to 2024 - 2025.

Similar to the enrollment trends for the entire campus, enrollment for each course within the chemistry department dipped as a result of the Covid-19 pandemic except for CHEM 101 (chemistry for allied health majors). Not only did enrollment not dip for CHEM 101, it gradually increased over the next few years before leveling off this last year. Enrollment for CHEM 103 has also increased over the last five years after an initial dip. Meanwhile, enrollment for CHEM 107 and CHEM 111A seem to be recovering from the pandemic but has yet to reach pre-pandemic levels. Enrollment for all other chemistry courses has leveled off but has not turned up (yet). However, since enrollment seems to be recovering for CHEM 107

and CHEM 111A, and since these courses feed into CHEM 111B, CHEM 211A and CHEM 211B, it is reasonable to expect that enrollment will recover for the rest of the courses in this sequence in the semesters to come.

It is not completely clear why enrollment has gradually increased for CHEM 101 and CHEM 103 over the last five years while enrollment has lagged for other chemistry courses. In the case of CHEM 101, perhaps there is increased interest in healthcare careers due to the pandemic. In the case of CHEM 103, the increase in enrollment could reflect the recovering enrollment for the campus as a whole since this course satisfies the IGETC general science requirement for all non-science majors.

3. How do you monitor and modify course offerings, including time and modality, to ensure that students' needs are being met?

The Chemistry Department is committed to meeting the needs of students. To meet the high demand for chemistry courses, sections are scheduled at the earliest possible time in the morning and run until late in the evening. In addition, one section of CHEM 107F is offered on Saturdays, since it has the highest enrollment among all courses offered within the department. As described in the previous section, most STEM majors need to take CHEM 107F to prepare for the first year of general chemistry, so every effort has been put forth to offer as many sections as space and time will allow. It should be noted that the number of sections offered for high demand classes are based on the availability of staff in the stockroom and facilities. To ensure that students are progressing through their chemistry courses in a timely manner, several courses are also offered during the summer term, with a 5-year average of 7 sections with an average of 140 enrollments.

In contrast to previous program review cycles, the Chemistry Department now offers several course sections in non-traditional teaching modalities. For example, as of Fall 2025, the Chemistry Department offers one section of CHEM 103 in a fully online format. It is important to note that a fully online modality is only possible for CHEM 103 because this course does not have a hands-on lab component. In regard to all other chemistry courses that include a lab component, one section of CHEM 100, one section of CHEM 101, two sections of CHEM 111A, and one section of CHEM 111B are now offered in a hybrid format in which only the lab components are taught in-person. As a final note, many discussions have occurred within the Chemistry Department to possibly create fully online courses that include a lab

component, but this proves particularly challenging when it comes to students performing experiments at home that include reacting chemicals that possibly introduce safety hazards in a non-lab environment.

2.2 Student Achievement

1. Using data provided by the OIE, describe overall student achievement counts, rates, and trends in your program over the past five years, these include: course success rates, degrees/certificates completion counts, transfer counts, licensing, job placement, wage improvements (not all of these measures apply to every program).

The data in Table 6 shows chemistry course success rates from 2020 – 2021 thru the 2024 – 2025 academic years. Over the last five years, overall student success rates in chemistry courses have exceeded the institutional set standards (ISS) on average except for CHEM 101 (chemistry for allied health majors). However, the 2021 – 2022 academic year did show a significant drop in student success across most courses within the chemistry program, which resulted in average success rates dropping below the ISS for that year. The possible reason(s) for CHEM 101 continuing to show success rates below the ISS will be addressed later in this program review.

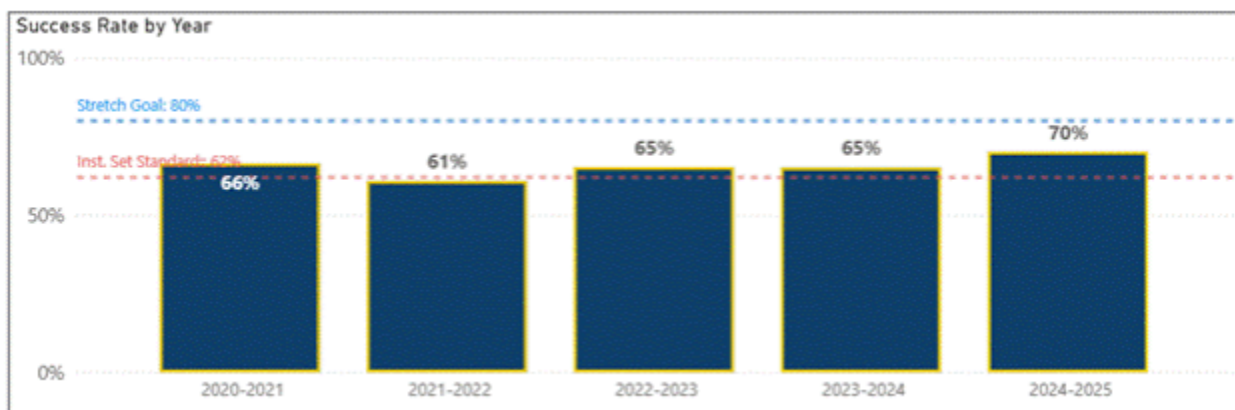
Table 6. Success rate by course for the 2020-2021 to 2024-2025 academic years.

COURSE	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	Total	
CHEM 100 F	79%	75%	75%	72%	67%	70%	73%
CHEM 101 F	66%	55%	64%	64%	60%	62%	61%
CHEM 103 F	78%	62%	67%	67%	66%	66%	73%
CHEM 107 F	61%	61%	60%	64%	64%	68%	63%
CHEM 111AF	68%	57%	70%	63%	63%	71%	66%
CHEM 111BF	64%	59%	65%	70%	70%	78%	67%
CHEM 201 F	65%	66%	62%	83%	63%	63%	67%
CHEM 211AF	69%	58%	63%	64%	64%	78%	67%
CHEM 211BF	74%	79%	94%	92%	78%	78%	81%
Total	66%	61%	65%	65%	65%	70%	66%

When comparing the yearly success rates for chemistry courses to success rates across the entire campus (see Figure 2), the significant decrease in success rates for the 2021 – 2022 academic year was unique to the chemistry department. In the 2021 – 2022, success rates dropped 7.6% from the prior year whereas success rates dropped only 1.4% for the entire college during the same time period. It is unclear what caused such an outsized drop in success rates for chemistry courses. However, the likely culprit was the pandemic. During this time, the Chemistry Department did all it could in trying to provide a “virtual” lab experience to help tie practical application to lecture content that would help students perform better in

the lecture portion of a course, but this proves extraordinarily challenging in a fully online format. Since the depths of the pandemic, chemistry success rates have recovered and, in some cases, are now higher than pre-pandemic levels as of the 2024 – 2025 academic year.

Chemistry Course Success Rates



Campus-wide Success Rates

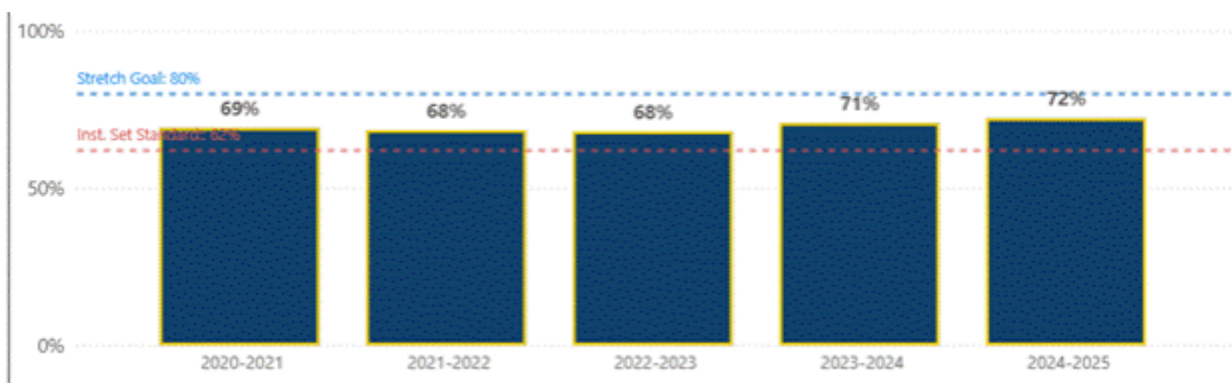


Figure 2. Yearly success rates for chemistry courses (top) and yearly success rates across the entire campus (bottom) from the 2020 – 2021 to 2024 – 2025 academic years.

As shown in Figure 3, the overall number of chemistry degrees awarded over the last five years has drifted slightly lower by about 11.5% (52 awarded in 2020 – 2021, but now down to 46 in 2024 – 2025). Of particular note is the massive drop in degrees awarded during the 2023 – 2024 academic year (only 34 degrees awarded). It is not entirely clear why such a drop occurred, but the most likely cause was the fallout from the decrease in success rates

that occurred two years earlier in the 2021 – 2022 academic year during the pandemic (this was addressed in Figure 2).

If many students were experiencing hardship during the pandemic year of 2021 – 2022, especially for those entering their first chemistry courses, this may have delayed the completion of chemistry associate degrees that would have occurred roughly two years later. This would also explain the rebound in chemistry degrees awarded that was observed in the 2024 – 2025 academic year because those delayed students have now finished their degrees. This thesis is also supported by the decrease in degrees awarded across the entire college during the same 2023 – 2024 academic year shown in Figure 4.

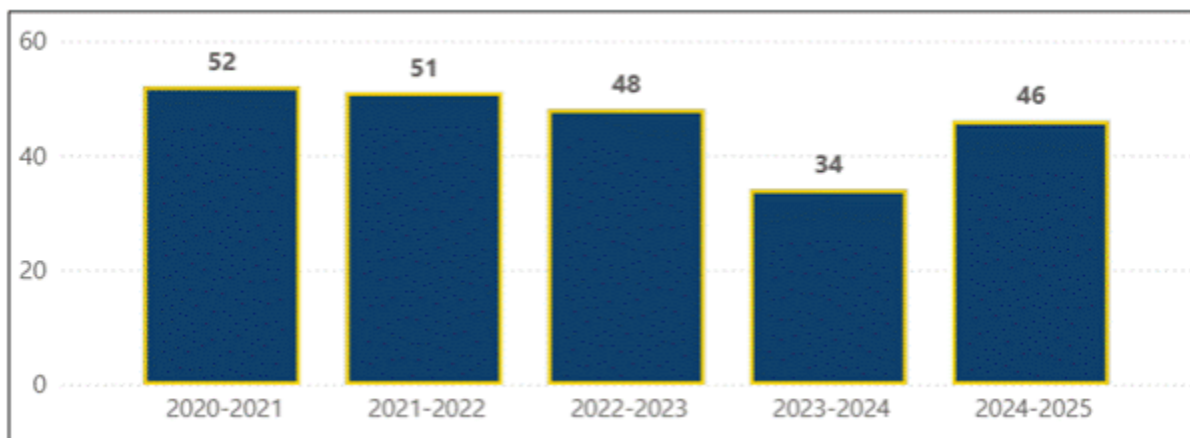


Figure 3. Total number of chemistry degrees awarded from the 2020 – 2021 to the 2024 – 2025 academic years.

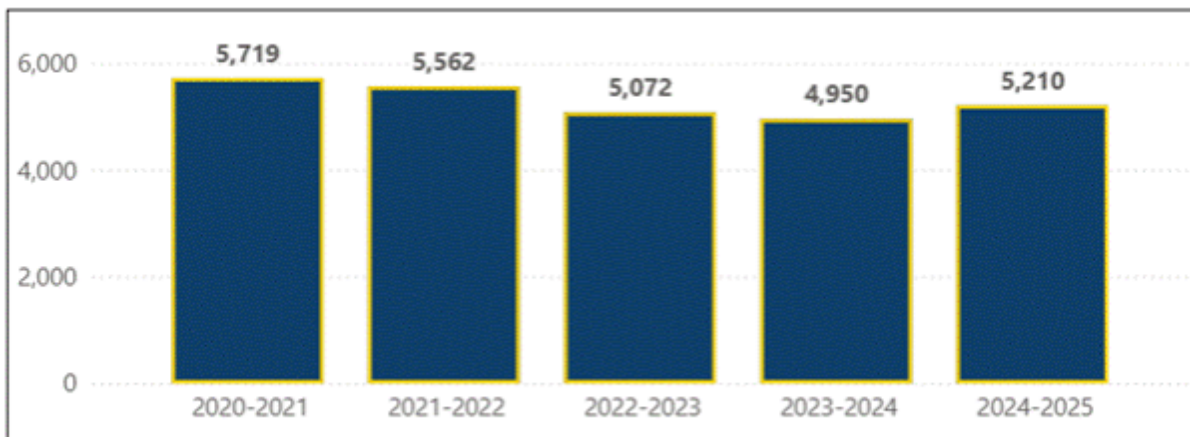


Figure 4. Total number of degrees awarded for the entire college from the 2020 – 2021 to the

2024 – 2025 academic years.

As shown in Table 7, nearly 91% of associates degrees in chemistry awarded over the last five years were non-transfer degrees. In other words, only about 9% of the students earning chemistry associate degrees were planning on transferring to a four-year university as a chemistry major. It is also quite possible that many students were awarded degrees in other STEM majors and transferred to a four-year university under a different major while still earning a non-transfer associates in chemistry. This is highly plausible given that a significant amount of AA or AS chemistry coursework overlaps with degrees in other STEM programs. Another possibility is that some students are obtaining dual chemistry degrees whereby one is an AS-T degree while another is an AA degree in chemistry (for example), although this would be only a minority of cases since so few students earned AA-T or AS-T degrees in chemistry relative to an AA or AS (non-degree transfer).

Table 7. Number (and types) of chemistry degrees awarded from 2020 – 2021 to 2024 – 2025.

Academic Year Award	2020-2021		2021-2022		2022-2023		2023-2024		2024-2025		Total	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Associate Degrees	46	88.46%	46	90.20%	41	85.42%	32	94.12%	45	97.83%	210	90.91%
Associate in Arts	25	48.08%	28	54.90%	22	45.83%	22	64.71%	28	60.87%	125	54.11%
Associate in Science	21	40.38%	18	35.29%	19	39.58%	10	29.41%	17	36.96%	85	36.80%
AA-Transfer/AS-Transfer	6	11.54%	5	9.80%	7	14.58%	2	5.88%	1	2.17%	21	9.09%
Associate in Science Transfer	6	11.54%	5	9.80%	7	14.58%	2	5.88%	1	2.17%	21	9.09%
Total	52	100.00%	51	100.00%	48	100.00%	34	100.00%	46	100.00%	231	100.00%

The explanation that many students are earning dual STEM associates degrees (one that includes an AA or AS in chemistry plus an associates degree in a different STEM discipline) is supported by the data in Table 8, which shows the transfer count for the 2020 – 2021 thru 2023 – 2024 academic years. What this table shows is that there was a total of 126 “unduplicated” students during this time period that earned associate degrees in chemistry. This is in stark contrast to what is shown in Table 7 in which 185 total chemistry degrees were awarded during the same academic years of 2020 – 2021 to 2023 – 2024. When dividing the number of degrees awarded by the count of unduplicated students who earned degrees, this ratio comes out to 1.47 degrees awarded per unduplicated (a.k.a. “unique”) student. The data in Table 8 also shows that roughly three-quarters (75.4%) of students earning associate’s degrees in chemistry are transferring to a four-year university.

Table 8. Unduplicated head count of students who earned an associates degree in chemistry during the 2020 – 2021 to 2023 – 2024 time period.

Academic Year Transfer Status	2020-2021		2021-2022		2022-2023		2023-2024		Total	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
No Transfer Record After Associate Degree	7	20.00%	9	25.00%	9	32.14%	7	25.00%	32	25.40%
Transfer After Associate Degree	28	80.00%	27	75.00%	19	67.86%	21	75.00%	95	75.40%
Total	35	100.00%	36	100.00%	28	100.00%	28	100.00%	126	100.00%

Data from Table 9 shows that, as a weighted average, 27% of students who started their degree sometime between Fall 2018 to Fall 2022 completed a chemistry associates degree within three years. The value of 27% comes from adding the weighted averages at the bottom of the first two columns (8% and 19%) in Table 9. In addition to this 27%, another 15% of students took longer than three years to complete their associates in chemistry (see bottom of last column in Table 9). However, this weighted average of 15% could be skewed up or down because for students who started their coursework in Fall 2022, they would now be potentially finishing their degree in Fall 2025 for which data is not yet available. However, if the 15% weighted average did hold, this would indicate that only $27 + 15 = 42\%$ of students are finishing their degrees at all. There also appears to be a rebound in 2-year and 3-year completion rates for the chemistry program for students who started in Fall 2022 relative to Fall 2021, which indicates that the pandemic played a role in lower completion rates for students who started in Fall 2020 and Fall 2021. This would also make sense when considering that the Fall 2022 semester was the first semester in which most chemistry classes returned to an in-person modality.

Table 9. Chemistry associate degree completion rates for students who started their coursework in the Fall 2018 to Fall 2022 semesters.

Term	Count	2 Year Completion Rate	3 Year Completion Rate	Greater Than 3 Years Completion Rate
Fall 2018	62	11%	18%	24%
Fall 2019	36		31%	11%
Fall 2020	41	7%	15%	17%
Fall 2021	34	3%	12%	15%
Fall 2022	36	14%	22%	
Total	209	8%	19%	15%

Clearly, it is disappointing that less than half (~42%) of all students who started their chemistry associates degrees from Fall 2018 to Fall 2022 completed their degrees. However, this result is not unique to the chemistry program. Similar completion timelines can be seen

in Table 10, which shows completion rates for all of Fullerton College. Table 10 shows that (assuming the Fall 2022 remains at 9%) only ~25% of students across all programs finished their associate degrees. A difference of ~42% completion rates for the chemistry program vs. ~25% for the college would indicate that the chemistry department is excelling at getting students to degree completion relative to other programs on average.

Table 10. Fullerton College associate degree completion rates for students who started their coursework in the Fall 2018 to Fall 2022 semesters.

Term	Count	2 Year Completion Rate	3 Year Completion Rate	Greater Than 3 Years Completion Rate
Fall 2018	4102	4%	9%	14%
Fall 2019	4196	6%	10%	11%
Fall 2020	3610	7%	10%	9%
Fall 2021	3129	7%	12%	7%
Fall 2022	3441	8%	11%	
Total	18477	6%	10%	9%

Adding all the percentages for each row in Table 9, yields the total chemistry degree completion rates by start year in Table 11. For example, the 2-year, 3-year and beyond 3-year completion rates for students who started in Fall 2018 from Table 9 are 11%, 18% and 24%, respectively. These add up to 53% for 2018 as seen in Table 11. What is interesting is that the chemistry degree completion average of students starting from Fall 2018 to Fall 2020 is 46%, but this weighted average increases to 61% when including students who *either* completed their degree *or* transferred. Therefore, it can be concluded that some students who do not complete their degree are still transferring.

Table 11. Yearly degree completion and / or transfer outcomes of first-time students entering the chemistry program from Fall 2018 to Fall 2020.

Term	Count	Degree Completion Rate	Transfer Rate	Degree/Transfer Completion Rate
Fall 2018	62	53%	66%	69%
Fall 2020	41	39%	56%	59%
Fall 2019	36	42%	44%	50%
Total	139	46%	58%	61%

While a degree completion rate of 46% and a transfer rate of 58% may seem low for the chemistry program (see Table 11), these numbers are much higher relative to the rest of Fullerton College (see Table 12). When comparing the data between the chemistry program and the rest of the college, it is clear that the chemistry department is much better at helping

its chemistry majors achieve degree completion and transfer compared to most other programs in the college, which has a combined degree completion rate of 26% and transfer rate of 30% for the Fall 2018 – Fall 2020 cohort. Possible reasons for this phenomenon will be discussed in the next few sections.

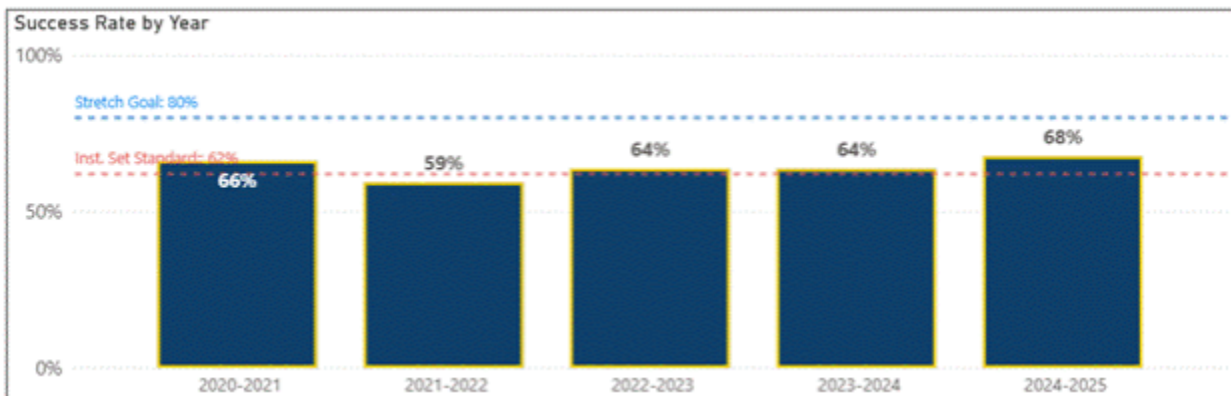
Table 12. Yearly degree completion and / or transfer outcomes of first-time students entering Fullerton College from Fall 2018 to Fall 2020.

Term	Count	Degree Completion Rate	Transfer Rate	Degree/Transfer Completion Rate
Fall 2018	4102	26%	32%	38%
Fall 2019	4196	26%	29%	36%
Fall 2020	3610	25%	28%	35%
Total	11908	26%	30%	36%

2. Are there student groups whose success rates are below the institution-set standard or whose success rates are below other student groups? What factors can explain this?

As was previously discussed, there was a drop in success rates among all students during the time of the pandemic (particularly during the 2021 – 2022 academic year; see Figure 2 in section 2.2 under question #1). Not surprisingly, this phenomenon is also observed when comparing course success rates for women and men separately (see Figure 5) over the last five years. Women seemed to be hit harder in this regard with success rates in chemistry courses dropping below the set standard in the 2021 – 2022 academic year. Success rates have rebounded for both women and men equally since then so that both are performing above the 62% ISS across all chemistry courses combined as of the 2024 – 2025 academic year. Yet women (68%) are still underperforming relative to men (72%) in the chemistry program. This is a bit unique to the chemistry program since men and women are equally successful in their courses for all of Fullerton College (see Figure 6).

Women



Men

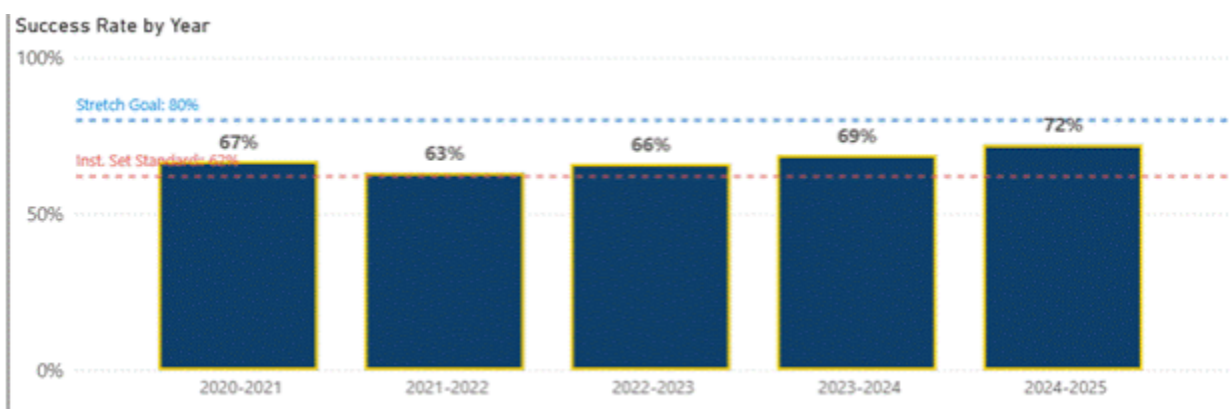
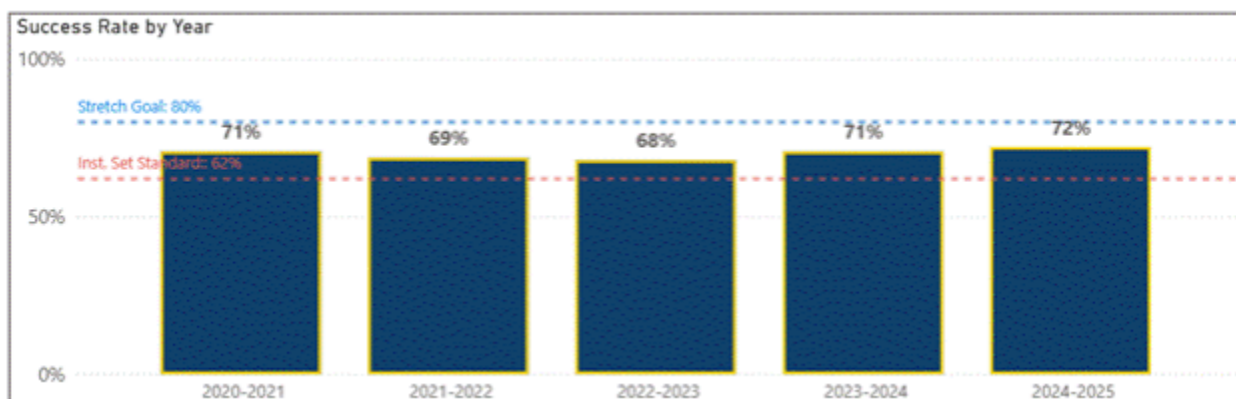


Figure 5. Total course success rates for women (top) and men (bottom) in the Chemistry Program.

Women



Men

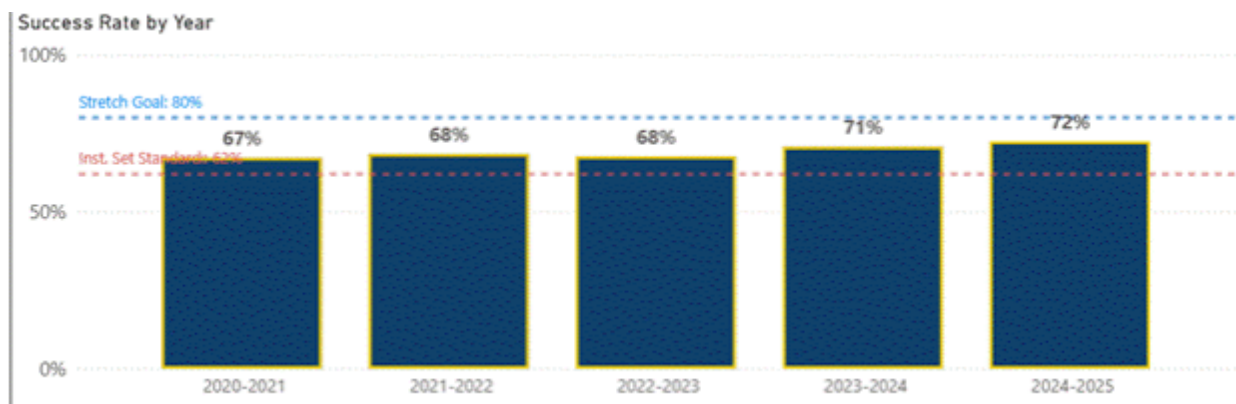


Figure 6. Total course success rates for women (top) and men (bottom) students for all of Fullerton College.

The primary reason why women appear to be having more difficulty passing courses in the chemistry program relative to men has to do with the success rates specific to CHEM 101 (chemistry for allied health majors; pre-nursing in particular). The enrollment headcount for women greatly outnumbers men in CHEM 101 (see Table 13). This is not surprising given the historically high level of women’s interest in nursing careers. When combining the increased enrollment of women in CHEM 101 with the fact that CHEM 101 has the lowest success rates of any course in the chemistry program (see Table 6 within section 2.2, question 1) along with one of the highest enrollments (see Figure 1 within section 2.1, question 2), women “appear” to have slightly lower success rates relative to men across the whole chemistry program when it is really more attributable to lower success rates for CHEM 101 students in particular. It should be noted that enrollment in CHEM 107 and CHEM 111A (the other two courses with the highest enrollments) have had nearly the same numbers of men and women enrolled over the last five years (see Table 14). Lastly, the success rates for women and men in all other chemistry courses combined are nearly identical (66% for women and 67% for men) over the last five years.

Table 13. Enrollment (headcount) by gender for students taking CHEM 101 within the chemistry program from the 2020 – 2021 to 2024 – 2025 academic years.

Academic Year	2020-2021		2021-2022		2022-2023		2023-2024		2024-2025	
Gender	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Female	201	70%	210	69%	197	64%	241	67%	245	70%
Male	78	27%	79	26%	100	32%	104	29%	93	27%
Unknown	7	2%	14	5%	11	4%	15	4%	12	3%
Total	286	100%	303	100%	308	100%	360	100%	350	100%

Table 14. Enrollment (headcount) by gender for students taking CHEM 107 and CHEM 111A within the chemistry program from the 2020 – 2021 to 2024 – 2025 academic years.

Academic Year	2020-2021		2021-2022		2022-2023		2023-2024		2024-2025	
Gender	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Female	488	52%	399	49%	323	44%	324	45%	363	46%
Male	411	44%	376	46%	360	49%	346	48%	372	47%
Unknown	43	5%	45	5%	52	7%	45	6%	52	7%
Total	942	100%	820	100%	735	100%	715	100%	787	100%

To investigate further into why CHEM 101 has the lowest success rates, and why women are disproportionately impacted by this, it is helpful to look at CHEM 101 enrollment by ethnicity rather than only by gender (see Table 15) and compare that to the enrollment by ethnicity for the entire chemistry program (see Table 3 in section 2.1, question 1, but also shown here for comparison). This comparison shows that CHEM 101 enrollment is comprised of a much higher percentage of Latina/o/x/e students (62.42% on average over the last five years) relative to the entire chemistry program (54.10%). Furthermore, the percentage of Asian students in CHEM 101 is significantly lower (13.54%) relative to the entire chemistry program (21.06%). The percentage of White students is also lower (9.97%) in CHEM 101 relative to the entire chemistry program (12.92%). Considering that Latina/o/x/e students historically have lower success rates relative to Asian and White students, this would explain the outsized lower success rates in CHEM 101 overall relative to the rest of the chemistry program. To summarize, the apparent underachievement of women in the chemistry program is really attributable to the outsized percentage of Latina/o/x/e enrolled in CHEM 101 (most of whom happen to be female) for which this student population is historically more economically disadvantaged.

Table 15. Comparison of enrollment (headcount) based on ethnicity for students taking

CHEM 101 (top) vs. the entire chemistry program (bottom) from the 2020 – 2021 to 2024 – 2025 academic years.

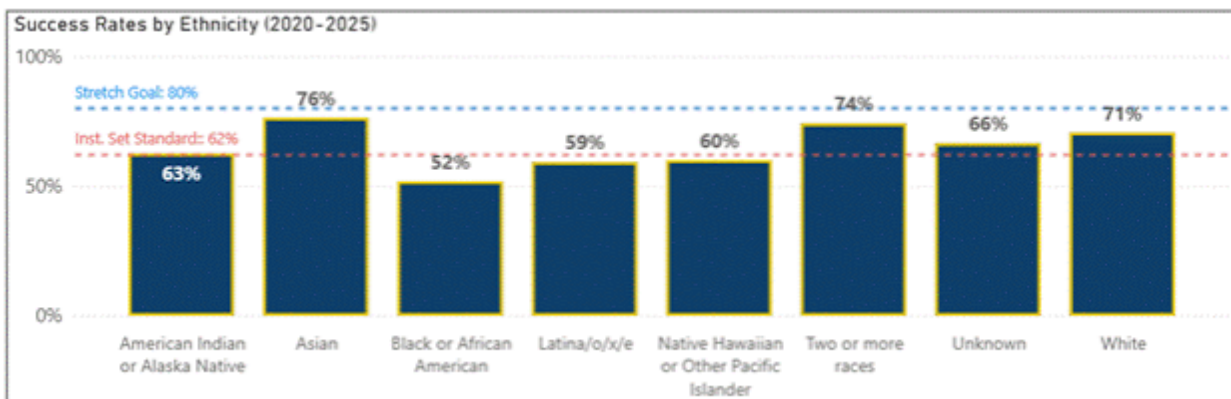
Academic Year Ethnicity	2020-2021		2021-2022		2022-2023		2023-2024		2024-2025		Total	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Asian	43	15.03%	47	15.51%	36	11.69%	55	15.28%	37	10.57%	201	13.54%
Black or African American	4	1.40%	7	2.31%	7	2.27%	8	2.22%	8	2.29%	31	2.09%
Latina/o/x/e	167	58.39%	190	62.71%	199	64.61%	221	61.39%	234	66.86%	927	62.42%
Native Hawaiian or Other Pacific Islander							1	0.28%	1	0.29%	2	0.13%
Two or more races	27	9.44%	28	9.24%	35	11.36%	48	13.33%	31	8.86%	158	10.64%
Unknown	4	1.40%	2	0.66%	4	1.30%	3	0.83%	5	1.43%	18	1.21%
White	41	14.34%	29	9.57%	27	8.77%	24	6.67%	34	9.71%	148	9.97%
Total	286	100.00%	303	100.00%	308	100.00%	360	100.00%	350	100.00%	1485	100.00%

Academic Year Ethnicity	2020-2021		2021-2022		2022-2023		2023-2024		2024-2025		Total	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
American Indian or Alaska Native	2	0.12%									2	0.03%
Asian	419	24.65%	351	23.60%	254	18.73%	250	17.57%	271	18.68%	1235	21.06%
Black or African American	3	0.18%	1	0.07%	2	0.15%	1	0.07%	1	0.07%	5	0.09%
Latina/o/x/e	868	51.06%	802	53.93%	761	56.12%	810	56.92%	828	57.06%	3173	54.10%
Native Hawaiian or Other Pacific Islander	4	0.24%	3	0.20%	1	0.07%	2	0.14%	4	0.28%	12	0.20%
Two or more races	129	7.59%	120	8.07%	145	10.69%	147	10.33%	156	10.75%	568	9.68%
Unknown	32	1.88%	20	1.34%	28	2.06%	28	1.97%	30	2.07%	112	1.91%
White	243	14.29%	190	12.78%	165	12.17%	185	13.00%	161	11.10%	758	12.92%
Total	1700	100.00%	1487	100.00%	1356	100.00%	1423	100.00%	1451	100.00%	5865	100.00%

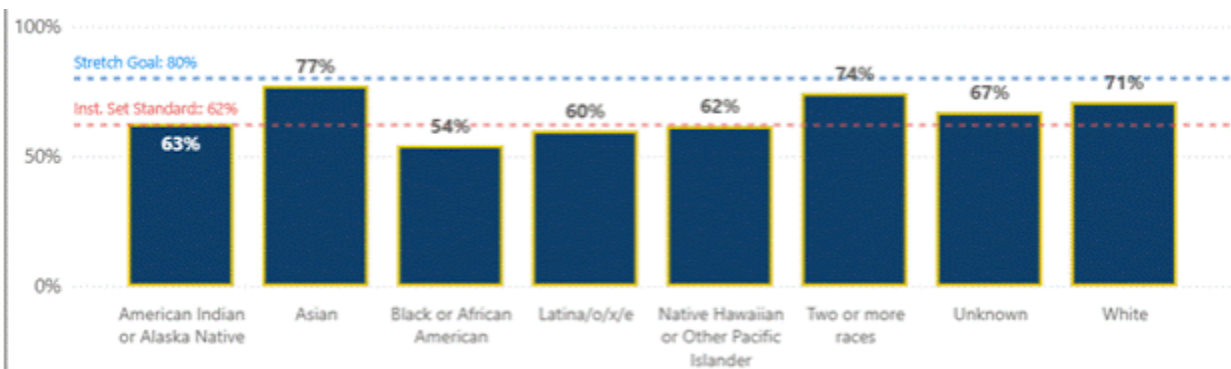
Unfortunately, the disproportionately low success rates for Latina/o/x/e are not isolated to CHEM 101 within the chemistry program. Figure 7 shows students success rates based on ethnicity for the entire chemistry program (top graph), the chemistry program excluding CHEM 101 (middle graph) and for all of Fullerton College (bottom graph). It is clear based on all three graphs that Latina/o/x/e are struggling more relative to other ethnic groups even no matter the context. The only ethnic group performing worse than Latina/o/x/e (59% success rate in chemistry) are Black or African American students (52% success rate in chemistry). Along with Native Hawaiian or Other Pacific Islander students (60% success rate), Latina/o/x/e and Black or African American students are the groups performing at or under the ISS of 62% in the chemistry program.

However, Figure 7 also shows that success rates rise significantly for Latina/o/x/e and Black or African American students when comparing success rates between the chemistry program and the entire college. Specifically, success rates for Latinx/o/x/e in the chemistry program is 59% vs. 67% for all of Fullerton College. Similarly, success rates for Black or African American students in the chemistry program is 52% vs. 57% for all of Fullerton College. Thus, what Figure 7 really shows is that while Latin/o/x/e and Black or African American students are struggling relative to other groups for all of Fullerton College, these groups are struggling even more so within the Chemistry program.

Chemistry Program (all courses)



Chemistry Program (w/o CHEM 101)



Fullerton College

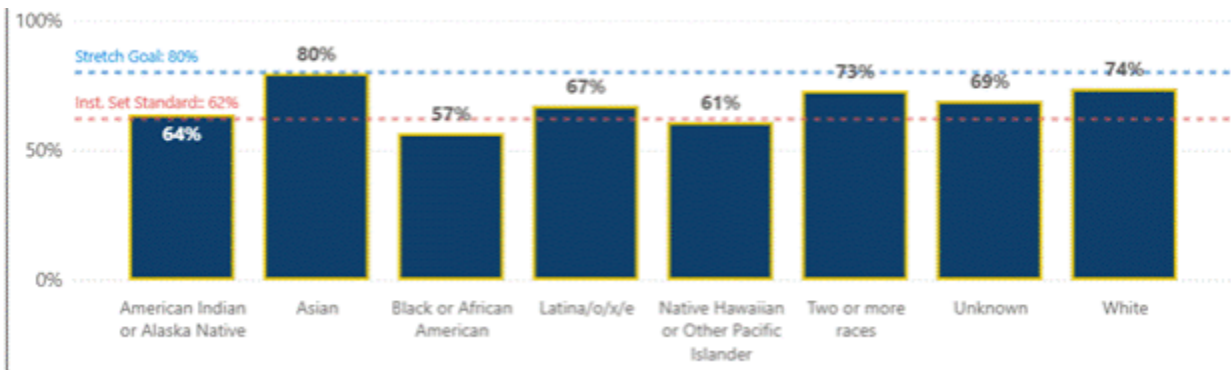


Figure 7. Total course success rates based on ethnicity for students in the Chemistry Program including CHEM 101 (top) and without CHEM 101 (middle) and for all of Fullerton College (bottom).

The success rates in Figure 7 certainly beg the question as to why Latina/o/x/e and Black or African students are struggling more in chemistry courses relative to how they are struggling in the rest of the college. One interesting comparison is to compare the success for Latina/o/x/e and Black or African students between the chemistry program and the rest of the Natural Sciences Division (see Figure 8). What this data shows is the Latina/o/x/e and Black or African students are still struggling in the chemistry program (59% and 52%, respectively) relative to the rest of the Natural Sciences Division (66% and 54%, respectively). Thus, there is more to these disparities than simply being science courses vs. non-science courses.

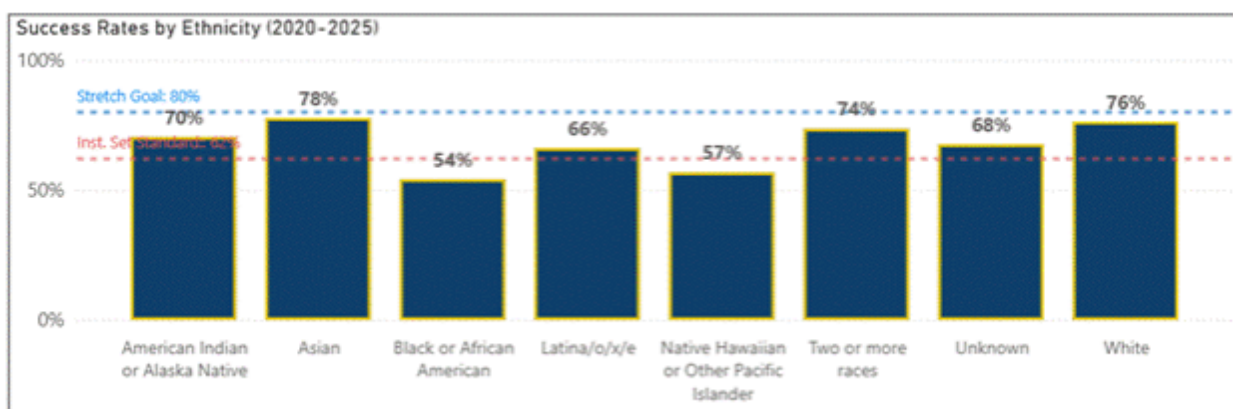


Figure 8. Total course success rates based on ethnicity for students in the Natural Sciences Division.

Another factor to consider is of all the courses offered in Natural Sciences, which course require the greatest amount of fundamental math skills compared to other courses within the Division. Generally, chemistry and physics courses require the highest level of math preparation among courses in Natural Sciences. When looking at success rates in the Mathematics Division, success rates are extremely low for Latina/o/x/e and Black or African students relative to other groups (see Figure 9). Thus, what appears to be happening is that the historically low math preparation for Latina/o/x/e and Black or African students in the K-12 education system is also manifesting into lower success rates in chemistry courses (although not nearly as low as in math courses) that often require higher level math skills for success to occur.

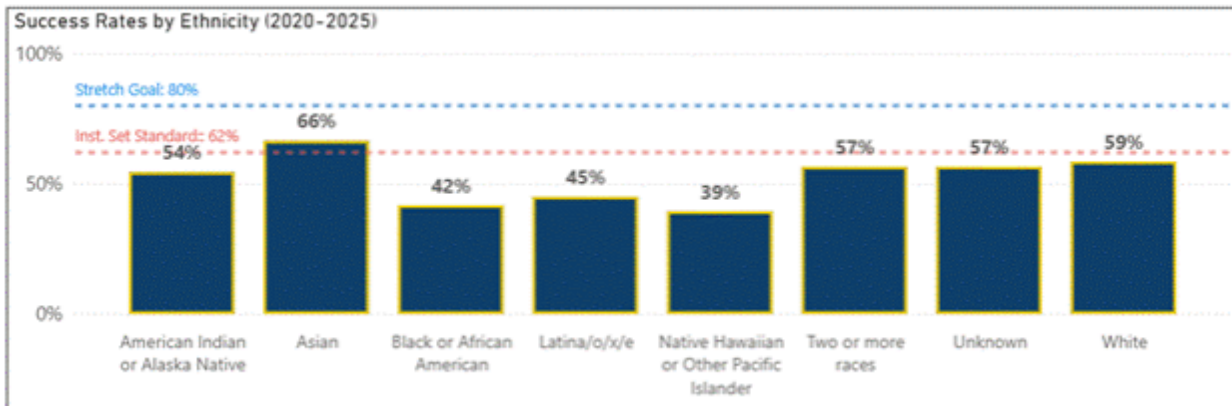
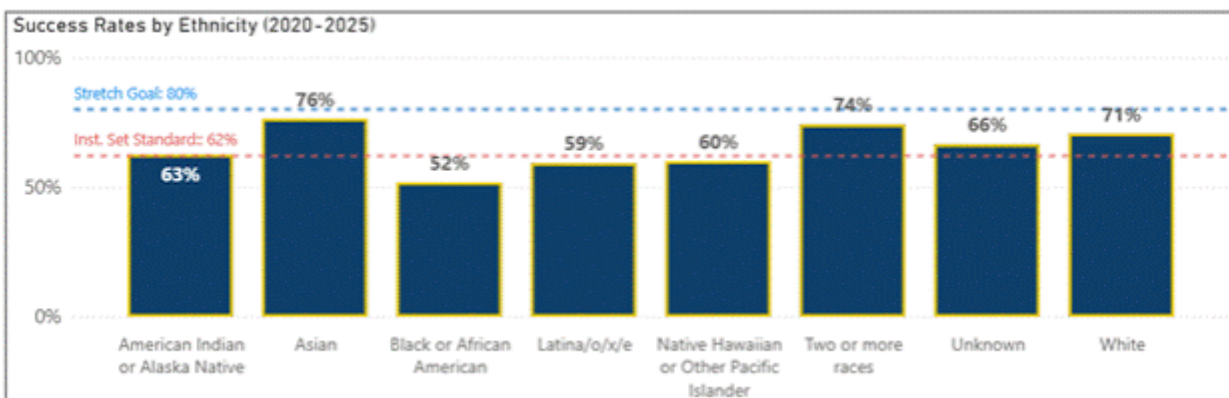


Figure 9. Total course success rates based on ethnicity for students in the Mathematics Division.

However, it is also worth noting that lower success rates for Latina/o/x/e and Black or African students are not seen in the physics program (69% and 63%, respectively, see Figure 10 bottom) relative to the chemistry program (59% and 52%, respectively). Said another way, if the lower success rates for Latina/o/x/e and Black or African students were purely due to poor math preparation, then poor success rates for these groups should also be seen in physics courses, not just chemistry. However, there is also an underrepresentation of women in the physics program whereas there is an underrepresentation of men in the chemistry program (see Figure 11 for comparison). What this indicates is that the population that is really struggling the most is not just Latina/o/x/e and Black or African students, but specifically, *female* Latina/o/x/e and Black or African students.

Chemistry Program (all courses)



Physics Program (all courses)

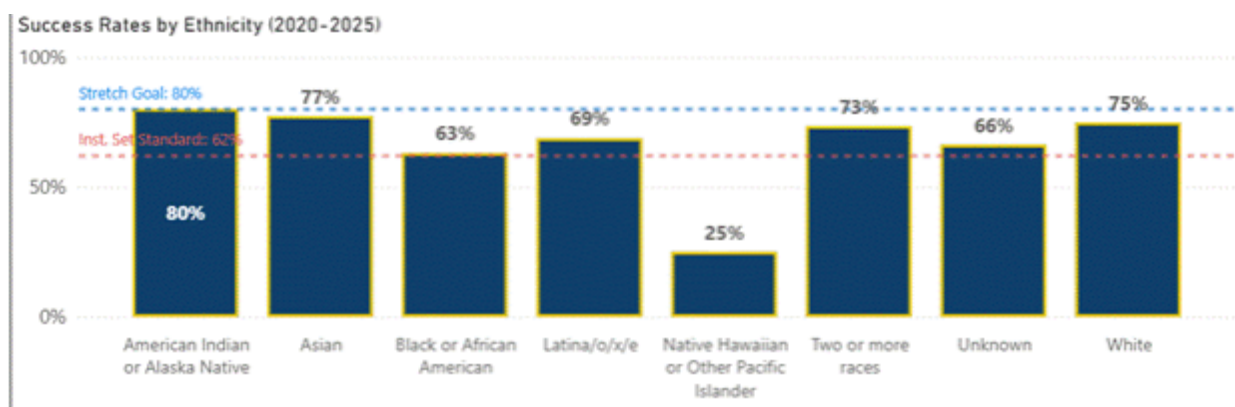


Figure 10. Comparison between total course success rates based on ethnicity for students in the Chemistry Program (top) and the Physics Program (bottom).

Chemistry Program (all courses)

Academic Year	2020-2021		2021-2022		2022-2023		2023-2024		2024-2025		Total	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Female	1010	55.86%	872	54.67%	744	51.35%	821	54.08%	846	54.09%	3443	54.72%
Male	718	39.71%	641	40.19%	620	42.79%	601	39.59%	627	40.09%	2512	39.92%
Unknown	80	4.42%	82	5.14%	85	5.87%	96	6.32%	91	5.82%	337	5.36%
Total	1808	100.00%	1595	100.00%	1449	100.00%	1518	100.00%	1564	100.00%	6292	100.00%

Physics Program (all courses)

Academic Year	2020-2021		2021-2022		2022-2023		2023-2024		2024-2025		Total	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Female	302	39.07%	331	43.27%	295	39.39%	323	40.22%	324	37.16%	1417	41.71%
Male	424	54.85%	384	50.20%	407	54.34%	432	53.80%	488	55.96%	1768	52.05%
Unknown	47	6.08%	50	6.54%	47	6.28%	48	5.98%	60	6.88%	212	6.24%
Total	773	100.00%	765	100.00%	749	100.00%	803	100.00%	872	100.00%	3397	100.00%

Figure 11. Headcount enrollment based on gender in both the Chemistry Program (top), and

Physics Program (bottom) for the 2020 – 2021 to 2024 – 2025 academic years.

It has been documented for many years that socioeconomic status is the main determinant for academic success assuming the educational institution holds high enough standards for achievement. The analysis in this program review clearly shows that female Latina/o/x/e and Black or African American students are most impacted by long-standing racial (and gender) inequities in the North Orange County region for which Fullerton College serves. Policies such as redlining (or reverse redlining) in the Southern California region have been documented as being responsible for geographic regions within cities to have much greater numbers of Latina/o/x/e and Black or African American citizens living in concentrated areas with less access to services and investment often afforded to their more affluent (often White or Asian) counterparts. Also, since school districts are heavily reliant upon local tax dollars for funding, schools in poorer neighborhoods receive less funding per student.

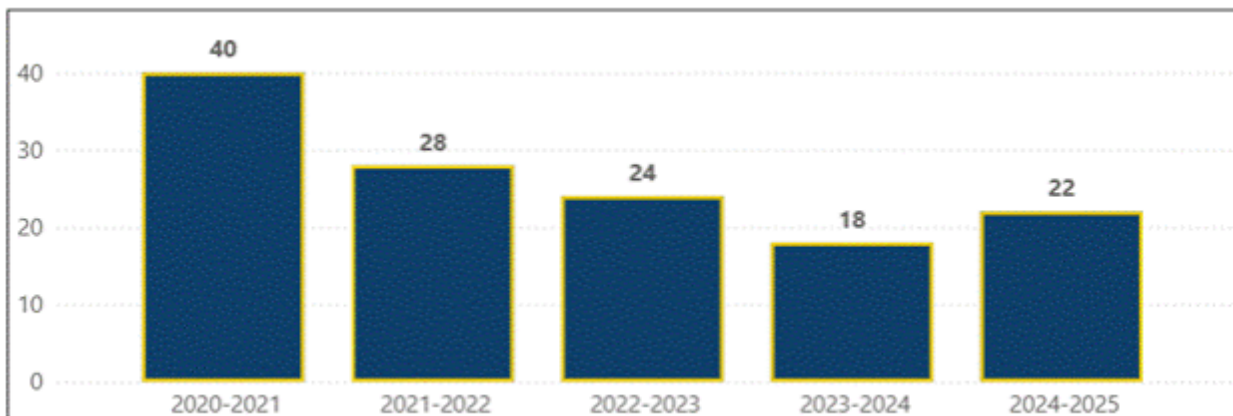
In addition to socioeconomic reasons, there is a gender inequality aspect to why female Latina/o/x/e and Black or African American students appear to be struggling the most in the Chemistry Program. Especially in Latin cultures, women have been expected to be the domestic care givers and providers of their families in addition to working outside of the home. These additional familial responsibilities are what is the likely reason why female Latina/o/x/e students are experiencing additional difficulties in succeeding in chemistry coursework. Moreover, the rigorous nature of chemistry coursework is often unforgiving (relative to many other disciplines) to students lacking in time to study because of additional familial responsibilities and who are also trying to make up for poor preparation that resulted from completing a grade school education in a poorly run school district.

3. In terms of your degree and certificate completers, are there any groups who are underrepresented in your completion data compared to the overall enrollment in your program?

Figure 12 shows the number of chemistry degrees awarded to men and women in each of the last five years. If the number degrees awarded are summed for the entire five years, it is found that 132 chemistry degrees were awarded to women vs. 91 chemistry degrees awarded to men from the 2020 – 2021 to 2024 – 2025 academic years. As a percentage, the number of chemistry degrees awarded to women comprised 59.2% of the total degrees awarded over the last five years. This means men earned 40.8% of the chemistry degrees awarded during the same time span. When comparing degree obtainment percentages to the enrollment percentages (see Table 1, section 2.1, question 1) of men (39.9%) vs. women (54.7%) in the chemistry program, there does appear to be an underrepresentation of men earning degrees

compared to women when considering that the percentage of degrees awarded to women (59.2%) is greater than the enrollment percentage (54.7%). It is also possible that students of “unknown” gender could also be underrepresented, but degree attainment data for this demographic was not available.

Chemistry Degrees Awarded to Women



Chemistry Degrees Awarded to Men

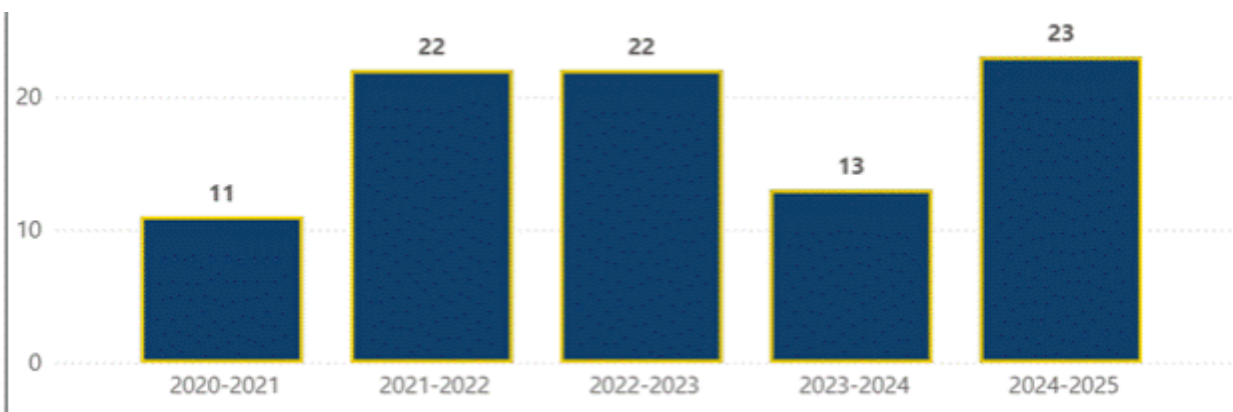


Figure 12. Number of chemistry degrees awarded based on gender. Degrees awarded to women (top) and men (bottom) are shown for each academic year.

As shown in Figure 13, there are also clear racial disparities between various ethnicities when comparing the percentage of chemistry degrees awarded (top) to the enrollment percentages of different ethnic groups (bottom). The most notable disparity is observed for Latina/o/x/e students in which the percentage of chemistry degrees awarded to Latina/o/x/e students was

only 40.26% of all degrees awarded, which is much less than their percent of enrollment of 54.10%. There is also a lower percentage of students that identify as two or more races earning degrees (4.76%) relative to their percentage of enrollment (9.68%). Students with unknown ethnicity also have lower rates of degree attainment (0.87%) relative to their enrollment percentage (1.91%). Thus, it can be concluded that identify as Latina/o/x/e, two or more races and unknown are all underrepresented in terms of degree completion.

Academic Year Ethnicity	2020-2021		2021-2022		2022-2023		2023-2024		2024-2025		Total	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
American Indian or Alaska Native	1	1.92%									1	0.43%
Asian	13	25.00%	17	33.33%	15	31.25%	7	20.59%	15	32.61%	67	29.00%
Black or African American	1	1.92%			2	4.17%	1	2.94%			4	1.73%
Filipino	2	3.85%	2	3.92%					2	4.35%	6	2.60%
Latina/o/x/e	25	48.08%	19	37.25%	21	43.75%	12	35.29%	16	34.78%	93	40.26%
Race/ethnicity unknown					1	2.08%	1	2.94%			2	0.87%
Two or more races	2	3.85%					2	5.88%	7	15.22%	11	4.76%
White	8	15.38%	13	25.49%	9	18.75%	11	32.35%	6	13.04%	47	20.35%
Total	52	100.00%	51	100.00%	48	100.00%	34	100.00%	46	100.00%	231	100.00%

Academic Year Ethnicity	2020-2021		2021-2022		2022-2023		2023-2024		2024-2025		Total	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
American Indian or Alaska Native	2	0.12%									2	0.03%
Asian	419	24.65%	351	23.60%	254	18.73%	250	17.57%	271	18.68%	1235	21.06%
Black or African American	3	0.18%	1	0.07%	2	0.15%	1	0.07%	1	0.07%	5	0.09%
Latina/o/x/e	868	51.06%	802	53.93%	761	56.12%	810	56.92%	828	57.06%	3173	54.10%
Native Hawaiian or Other Pacific Islander	4	0.24%	3	0.20%	1	0.07%	2	0.14%	4	0.28%	12	0.20%
Two or more races	129	7.59%	120	8.07%	145	10.69%	147	10.33%	156	10.75%	568	9.68%
Unknown	32	1.88%	20	1.34%	28	2.06%	28	1.97%	30	2.07%	112	1.91%
White	243	14.29%	190	12.78%	165	12.17%	185	13.00%	161	11.10%	758	12.92%
Total	1700	100.00%	1487	100.00%	1356	100.00%	1423	100.00%	1451	100.00%	5865	100.00%

Figure 13. Comparison of the number of chemistry degrees awarded in the chemistry program (top) vs. enrollment in the chemistry program (bottom) based on ethnicity from the 2020 – 2021 to 2024 – 2025 academic.

4. Are your students completing your degree and certificate program requirements in the expected time frame? Are there certain groups whose rates are below other student groups? Discuss any efforts to improve time to completion.

To assess whether students are finishing degrees in the expected timeframe, it is worth defining what “expected timeframe” means. The average length of time it takes for all students to complete their associates degree, regardless of degree type or discipline across all of Fullerton College, is 4.64 years during the 2020 – 2021 to 2024 – 2025 academic years (according to data provided by OIE). In contrast, the weighted average for degree completion based on ethnicity for completing a chemistry associates degree is 4.37 years (see Table 16). By this metric, the chemistry program is more efficient at helping students finish their degrees compared to the rest of the college. It could be argued that a desirable degree

timeline would reflect the customary “2-year” designation that often is ascribed to an associate’s degree. In this case, there is much room for improvement in degree completion timelines for the chemistry program.

Table 16. Average years to graduation with an associate’s degree in chemistry based on ethnicity for the 2020 – 2021 to 2024 – 2025 academic years (combined).

Ethnicity	Number of Degrees Awarded	Percent	Average Years to Degree Completion
American Indian or Alaska Native	1	0.62%	3.00
Asian	45	27.78%	3.91
Black or African American	3	1.85%	5.67
Filipino	3	1.85%	9.33
Latina/o/x/e	68	41.98%	4.88
Race/ethnicity unknown	2	1.23%	3.50
Two or more races	9	5.56%	2.22
White	31	19.14%	4.00
Total	162	100.00%	Wt. Avg.: 4.37

As shown in Table 16, there are clearly some ethnicities that exceed the 4.64-year average for the college. These include Latina/o/x/e (4.88 years to completion), Black or African American (5.67 years to completion), and Filipino students (9.33 years to completion). The reasons for the longer degree completion timelines for Latina/o/x/e, Black or African American, and Filipino students are closely linked to the same reasons for lower success rates

previously mentioned. Specifically, these students are more likely to need to work more hours at jobs away from school and devote more time to familial obligations due to economic hardship. These obstacles result in less time for students to study for their classes. Compounding the situation for these students is the fallout of subpar instruction during K-12 education, which results in a need for remedial coursework (CHEM 107 for example) just to reach “college” level chemistry coursework (CHEM 111A for example). It is estimated that roughly 90% of incoming students in the chemistry program need to take CHEM 107 (preparatory chemistry) just so that they can successfully pass general chemistry I (CHEM 111A) even though CHEM 107 is not required for degree completion. Lastly, poor math skills also lead to delays in degree completion since math proficiency is an unavoidable requirement to be able to succeed in chemistry.

Much of the discussion among faculty in the chemistry program regarding the shortening degree completion timelines has involved implementing more equity-based grading policies and pedagogies in the chemistry curriculum to hopefully incur higher success rates. Higher success rates directly correlate with shorter degree completion timelines because students would be repeating classes less often. In addition, as of this semester, 50% of the full-time faculty in the Chemistry Department have completed the CoRE (Course Redesign for Equity) program at Fullerton College with one of these faculty being a facilitator in the CoRE program. However, only one part-time instructor has gone through CoRE. Given that adjunct faculty teach roughly half of the courses in the chemistry program, there is clearly room for improvement in this regard.

Efforts are underway by course coordinators within the Chemistry Department to generate course content for the class sections they coordinate that will lead to more equity-minded lab curriculum. For example, one faculty member recently applied for a year-long sabbatical to re-write parts of the CHEM 111A lab manual so that it includes elements of intersectionality and partnership among students in a way that also adjusts lab assignments to be more transparent. Another full-time faculty member plans to apply for a sabbatical next year to accomplish the same task for the CHEM 107 courses. Lastly, the Chemistry Department is also planning on re-implementing chemistry-focused adjunct faculty professional development workshops that have been offered in the past, but with greater emphasis on equity-based practices.

2.3 Student Learning Outcomes

1. Describe your program’s processes and practices for defining, assessing, and analyzing

student learning outcomes at the course (CSLO) and program (PSLO) level. Include a discussion of how your program uses the results of CSLO/PSLO data to inform course and program improvement efforts.

The Chemistry Department ensures that student learning outcomes align with the instructional objectives for each course. The CSLOs have been developed to assess major course concepts as effectively as possible. For example, lower-level CSLOs are based on foundational knowledge and skills, whereas higher-level CSLOs reflect more complex thinking skills and advanced experimental data analysis. This may include evaluating common exam questions where a passing score on those questions is considered success. Another example is the evaluation of lab practical exams, along with instructor analysis of specific experiments for each course. Proficiency in a majority of the procedures appropriate for each course is considered successful. The PSLOs are developed to ensure they reflect the key elements of the Guided Pathways guidelines. Currently, PSLOs are assessed through CSLOs, which are mapped to them. Therefore, all PSLOs are assessed throughout the student's progression in the program. The department's requirement for assessing CSLOs is that every CSLO be assessed at least once every three years. Some courses will assess all three to four CSLOs in a single semester, while others will stagger the assessment and evaluate one or two of them annually.

The department utilizes the CSLO/PSLO data in discussions about course-level expectations and the progression of skills expected as students move through the program. The course-level data have led to changes in the laboratory program for general chemistry, resulting in an improvement in student competencies. Important findings have led to updates of digital equipment, revisions to course textbooks, and an expansion in the scope and depth of student laboratory notebook requirements. Since the last program review, the department has added hybrid sections of various courses and is offering one course section during the winter intersession. Once data from OIE is provided, any changes/improvements to these newer course additions will be addressed.

2. (OPTIONAL/NOT REQUIRED) Using the data provided by OIE, describe the most salient results of CSLO or PSLO mastery rates. Did you find significant differences by race, ethnicity, gender, and other categories?

Section 3: Other Areas of Program Effectiveness

1. Document any substantial changes to your program curriculum since the last review and

discuss what prompted these changes. Looking forward, what changes to the curriculum do you plan based on the emerging needs of your discipline, industry, student population, etc.

The recent revision of the general education pattern (as required by Title 5) required the inclusion of a new general education area in ethnic studies (Area 6). The inclusion of this additional general education area, along with the decision by the Fullerton College Curriculum Committee to require the completion of an additional course (Area 7: Lifelong Learning and Self-Development) for graduation with a local degree, led the Chemistry Department to evaluate the continued offering of its local degrees and the Associate in Arts degree, in particular. The requirement that students complete an additional course (in Area 7) will result in fewer units for elective courses in reaching the 60 units required for local degrees and, therefore, a disparity in additional coursework for graduation in comparison to the transfer degrees. However, given the importance of providing students with various options for graduating with a chemistry degree, the Chemistry Department affirmed its desire to offer both local degrees, an Associate in Arts degree and Associate in Science degree. Aside from supporting Fullerton College under the new Student Centered Funding Formula by awarding more degrees, the continued offering of the local associate's degrees will provide students with recognition of their efforts and an additional path towards success. Additionally, these two local degrees will continue to compliment the Associate in Science for Transfer (to a CSU) degree and Associate in Science for UC transfer degree.

Currently, the Chemistry Department offers two transfer degrees: an Associate in Science Degree for Transfer (to the CSUs) and an Associated in Science Degree for UC Transfer. While both degrees require two years of chemistry (general chemistry and organic chemistry), the two degrees differ in the amount of additional coursework in physics and mathematics. The UC transfer degree requires two more semesters of mathematics and an additional semester of physics. With the development of Cal-GETC, the Chemistry Faculty Discipline Review Group (FDRG) was tasked with the development of a single transfer degree for both the CSUs and UCs. This new transfer degree under Cal-GETC will be similar to the UC transfer degree and, therefore, will require additional coursework (units). It is currently awaiting approval, and is expected to become available this next spring. Once the template is available, the Chemistry Department will take action to add this degree to the Fullerton College catalog, with implementation expected for Fall 2027.

2. Please briefly describe opportunities your students have to apply and deepen knowledge and skills through projects, apprenticeship, internships, co-ops, clinical placements, group projects outside of class, service learning, study abroad, and other experiential learning activities that you intentionally embed in coursework or elsewhere in your program.

The faculty members of the Chemistry Department, alongside student volunteers, have been active throughout the years in various activities to support the learning community at Fullerton College. These activities include hands-on chemistry activities for at outreach events such as

KinderCaminata and Chemistry Day at the Santa Ana Zoo. Additionally, the faculty of the Chemistry Department have served as mentors and facilitated peer-to-peer mentorship in programs such as Hornets Tutoring, PUMP (Peer Undergraduate Mentoring Program), BOND (Building Opportunities Through Networking and Diversity), and the STEM-SLC (STEM Success Learning Community) program. Students within the chemistry program are encouraged to become actively involved in community programs, and are also directed toward research programs at local four-year institutions. These research programs include Project RAISE (Regional Alliance in STEM Education) at California State University, Fullerton, MacREU (Materials Connection Research Experience for Undergraduates) at University of California, Riverside, the WAVE Fellows program at California Institute of Technology, and Chem-SURF (Summer Undergraduate Research Fellowship) at University of California, Irvine.

3. Describe any laws, regulations, trends, policies, procedures, or other influences that have an impact on your program. These can include things like Vision 2030, CALGETC, Common Course Numbering, etc.

As previously discussed, the implementation of Cal-GETC will impact the degree offerings by the Chemistry Department. Rather than offer two separate transfer degrees, a single transfer degree (for both CSUs and UCs) will be created by the department. In addition to the creation of this degree, the Chemistry Department anticipates revising the course curriculum to accommodate AB 705 and the Common Course Numbering project.

The Assembly Bill AB 705 allows students the opportunity to enroll directly into transfer-level courses without first completing remedial coursework. With the implementation of AB 705, the Mathematics Department has begun reducing the number pre-transfer level course offerings and, in particular, the number of course sections associated with the advisories and pre-requisites for CHEM 107 F Preparation for General Chemistry and CHEM 111AF General Chemistry I. In lieu of college algebra (MATH 141 F/HF or MATH 143 F), the Mathematics Department will encourage students to complete MATH 140 F Precalculus. So as to ensure students are aware of these changes, efforts have been taken to update the degree paths on the Fullerton College *Program Mapper* website. Additionally, the Chemistry Department will revise the CHEM 107 F and CHEM 111AF (and CHEM 111BF) course outlines of records in coincidence with the Common Course Numbering project.

The Common Course Numbering (CCN) project will lead to the assignment of the same course number to CHEM 107 F Preparation for General Chemistry, CHEM 111AF General Chemistry I, and CHEM 111BF General Chemistry II. In addition to the adoption of the new course number, the CCN project will require a change to the material that is presented within CHEM 111AF and CHEM 111BF. In particular, the topic of *Solutions*, though currently taught in the first-semester course (CHEM 111AF), will be taught in the second-semester course (CHEM 111BF). The movement of this

topic from one course to the other, is expected to assist with student success in the first-semester course, as there will be less material covered, particularly at the end of the term. Whereas this topic is being move into the second-semester course, it is possible to eliminate one of the topics currently being taught (Transition Metals and Coordination Chemistry). This particular topic has little relevance to the remainder of the topics taught in the course and, most importantly, is not covered on the standard exam produced by the American Chemical Society. Replacing the current topic with that of *Solutions* will permit the use of the standard exam in the second-semester general chemistry course. In whole, the anticipated revision to the course curriculum with the implementation of the CCN project is expected to greatly benefit students.

Section 4: Faculty and Staff

4.1 Population and Demographics

1. Using the data provided by OIE, describe your program's staff (full-time/part-time faculty, nonfaculty, classified). How reflective of your program's student population is your staff?

The chemistry program at Fullerton College currently employs 10 full-time faculty (1 on leave), 19 adjunct faculty, and 2 laboratory technicians. At present time, our faculty are not reflective of our programs' student population. While our faculty are predominantly male (62%, see Figure 1) and either Asian or White (each 41%, see Figure 2), our students are mostly female (54%) and LatinX (57%, compared to only 10% of our faculty identifying as LatinX). These are persistent trends over the last five years. Notably, the number of Black/African American faculty in our department has decreased significantly from 15% of our full-time faculty in AY 2020-2021 down to 0% the past two years. This is an issue of concern because women and BIPOC (Black, Indigenous, and People of Color) individuals are historically underrepresented in STEM (Science, Technology, Engineering, and Math) fields both in industry and in academia. Research suggests that outcomes improve for students from marginalized groups when they have access to professors and mentors with similar racial/ethnic backgrounds, demonstrating a need for faculty diversity (Cross & Carman, 2022).

It is also worth noting that Fullerton College has a significant number of Southwest Asian and North Africa (SWANA) students and faculty but, since they are not given a distinct category, their data is often misrepresented under "Unknown" or even "White". To ensure more accurate and meaningful demographic reporting, it would be beneficial to disaggregate the data further by including a separate category for SWANA students and faculty.

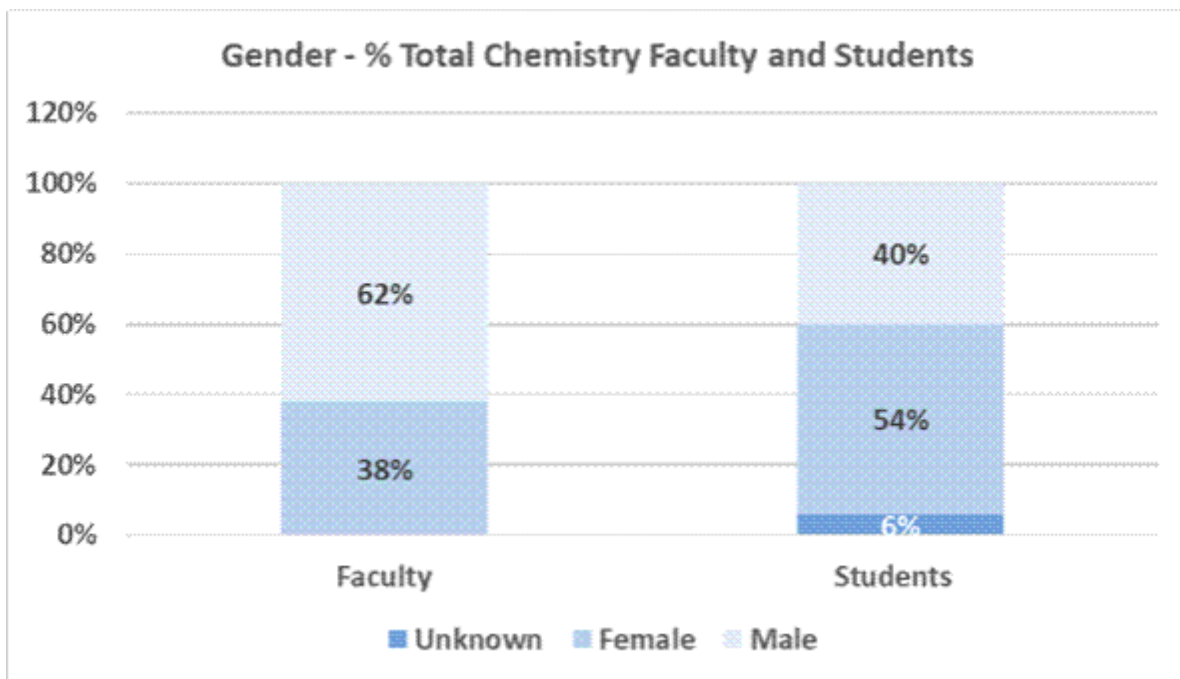


Figure 1. AY 2024-2025 gender percentage comparisons between students and faculty (both full- and part-time).

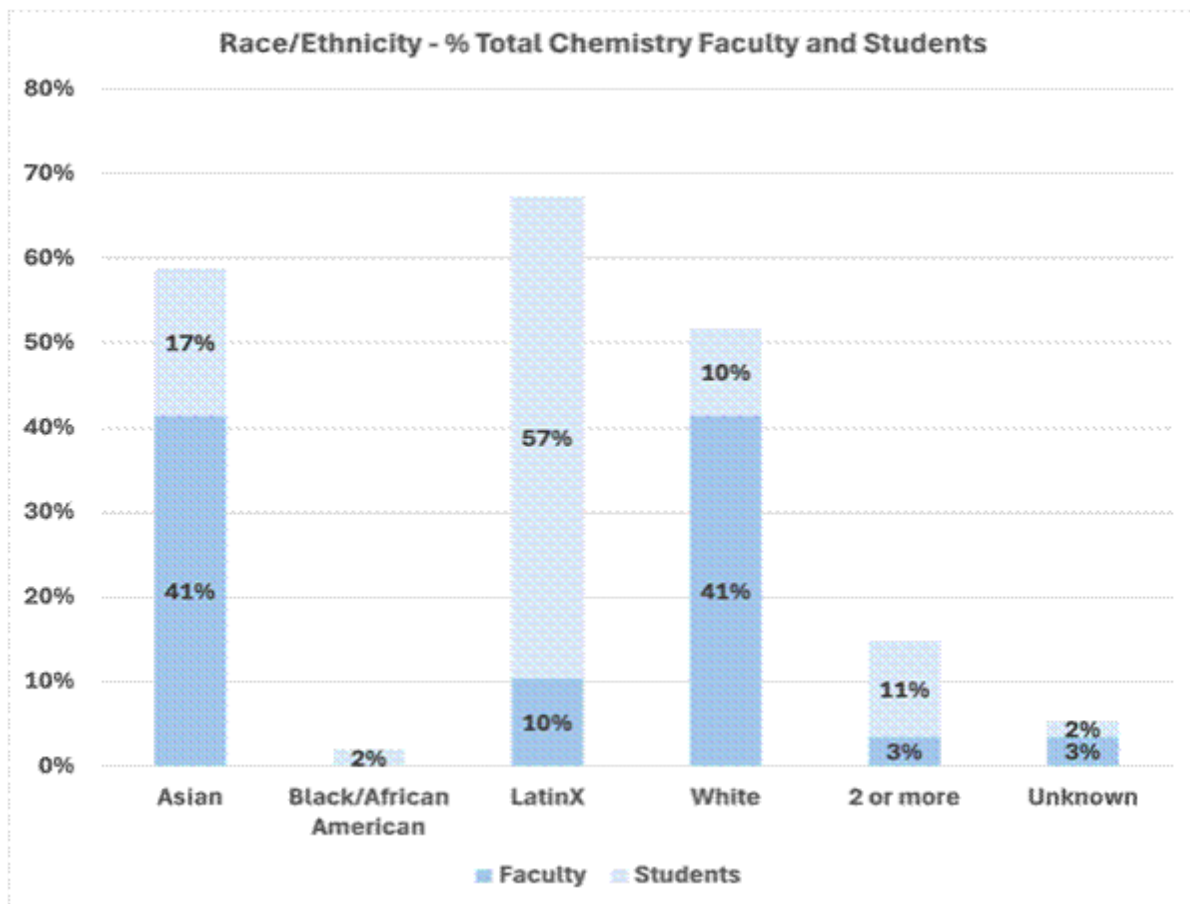


Figure 2. AY 2024-2025 race and ethnicity percentage comparisons between students and faculty

(both full- and part-time).

Cross, J. D., & Carman, C. A. (2022). *The relationship between faculty diversity and student success in public community colleges*. *Community College Journal of Research and Practice*, 46(12), 855-868. <https://doi.org/10.1080/10668926.2021.1910595>

2. Describe your program's staffing changes since fall 2021. How have these changes impacted your program's ability to achieve its strategic action plans?

Over the last five years, the total number of faculty, both full- and part-time, reached a peak of 37 during the 2022-2023 academic year and has since dropped to 29 (a 22% decrease, see Figure 3). This change was mostly due to the hiring of adjunct faculty as the number of full-time faculty has steadily declined from 13 in the 2020-2021 academic year to only 10 most recently (a 23% decrease).

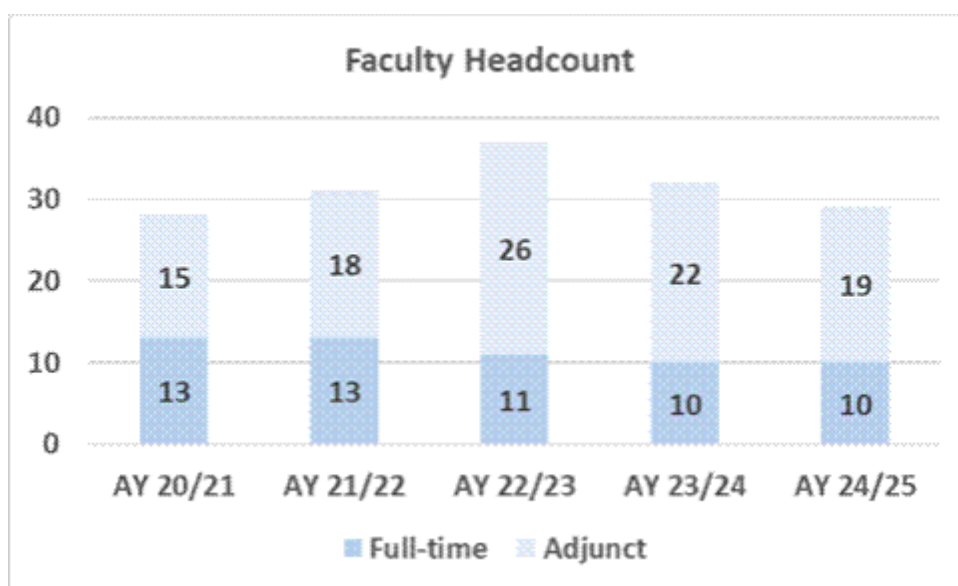


Figure 3. Number of full-time and part-time chemistry faculty over the last five years.

Since our last program review, the department has had two full-time faculty members leave for dean positions, three have retired, and one laboratory technician has also retired. In that time, we have hired one laboratory technician and only two new faculty. Figure 4 shows that the ratio of adjunct to full-time faculty increased considerably from approximately 1:1 in AY 2020-2021 to well over 2:1 in AY 2023-2024, the highest it has been in at least 10 years. Although it has slowly begun to decline, it remains high at approximately 2:1. Regarding this ratio, we are well outside the goal set in *California Assembly Bill 1725* (1988) and in the *ACS Guidelines for Chemistry in Two-Year College Programs* (American Chemical Society, 2023) of 75% full-time to 25% part-time faculty, where currently (Fall 2025), 50% of our sections are taught by adjuncts.

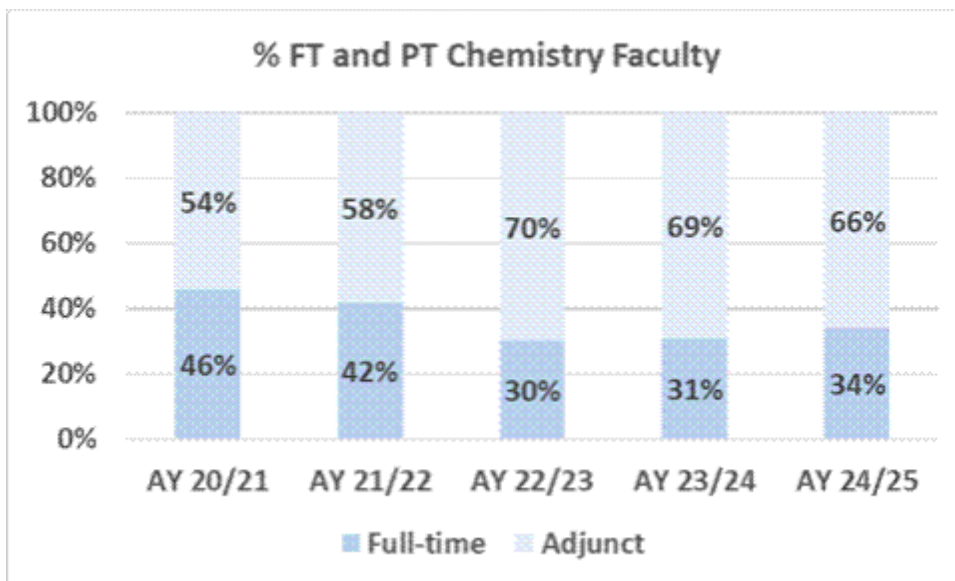


Figure 4. Percentage of full-time and part-time chemistry faculty over the last five years.

While some adjunct faculty have remained consistently employed by the college, there are typically high turnover rates for part-time faculty which affects the coherence and effectiveness of our program. Adjunct faculty are not required to engage in additional service activities for the college or our department such as coordinating courses, serving on committees, interviewing new part-time faculty, performing program review, collecting and analyzing student learning outcome data, and developing curricula, among other duties. Although they may be invited to participate in some of these activities, it is often not possible for them if they are teaching at different colleges concurrently. As such, these responsibilities fall solely to full-time faculty to perform in addition to their regular teaching loads. Interviewing, training, and managing a greater number of adjunct faculty also contributes to the workload of department and course coordinators. In general, this has made it very challenging for full-time faculty to implement and maintain certain strategic action plans that require an additional time commitment, despite how well-intentioned they are. In our last program review we put forth several strategic action plans, such as bimonthly training seminars for adjuncts, community outreach, and student boot camps, which, coordinated entirely by full-time faculty, have not been possible to maintain without a greater number of faculty to share this burden. Therefore, the increase in the number of part-time relative to full-time faculty presents an issue from this perspective.

4.2 Staff Support and Professional Development

1. Describe the regular discussions your program faculty are having about equitable grading, attendance, late work, extra credit policies, and other strategies to support equitable student success.

The faculty members of the Chemistry Department are committed to implementing equitable policies in the classroom. The faculty members have met to discuss classroom policies to improve student success. These policies include the development and implementation of efforts that provide students with the necessary support to improve success rates. Individual faculty members are currently pursuing best practices, and several efforts are being put forth towards fostering an equitable classroom environment to improve student success. Additionally, the Chemistry Department will be discussing in the near-term revisions to the course outlines of record to accommodate recent changes to Title 5, specifically the integration of diversity, equity, inclusion, and accessibility.

2. How have these conversations shaped practices or policies in your program? What action has arisen from these discussions? If no action has been taken, why not?

In an effort to address the development and implementation of equitable policies, faculty members of the Chemistry Department have participated in various activities. These activities include C-JUSTICE (Climate Justice in Undergraduate STEM Incorporating Civic Engagement) and CoRE (Course Redesign for Equity). C-JUSTICE provides educators with access to instructional approaches that link climate justice and civic engagements across the curriculum and, in particular, provide a special emphasis on STEM. C-JUSTICE is expected to improve STEM education through the development of course modules. These modules will provide instruction in solving complex problems through disciplinary practice, civic engagement, equity, and systems thinking. In addition to providing faculty with professional development opportunities, the intent of the C-JUSTICE project is to improve STEM teaching and learning for all students, and increase the participation of underrepresented groups in STEM. Additionally, the faculty of the Chemistry Department have assisted Staff Development facilitate CoRE (Course Redesign for Equity). CoRE participants receive pedagogical training in order to redesign their existing courses to incorporate more equitable grade

distributions, assignments, and language. Emphasis is placed on creating 'equitized syllabi' and culturally relevant assignments to increase active participation from minoritized students. Syllabi, online discussion assignments, and homework were among the content redesigned during this professional development course.

3. What additional areas of professional development could help your faculty and staff engage in this work?

The Chemistry Department offered a professional development workshop for the adjunct instructors of CHEM 107 F Preparation for General Chemistry during the summer of 2019. This workshop, led by full-time faculty members, was designed to serve as a “workshop” for part-time faculty, and it provided effective strategies to assist with student success. This endeavor provided the part-time faculty with skills and best-classroom practices essential to improving student success and, notably, provide equitable learning environments. Unfortunately, a lack of financial support in the years that followed have prevented the Chemistry Department from offering additional workshops. However, should financial support become available, the Chemistry Department would begin offering these workshops on a regular basis, with the intent to extend the workshop to other courses in the program, reaching as many part-time instructors as possible and supporting the students of Fullerton College.

Section 5: Program Planning

5.1 Progress on Previous Strategic Action Plans

1. Please discuss the goals (Strategic Action Plans, SAPs) from your last self-study. Assess and explain your progress on each of the SAP.

SAP#1: Create a Campus STEM Resource Center

The Fullerton College STEM Center officially opened on the Fullerton College Campus in Spring 2025. In the first 10 weeks of the Fall 2025 semester, the STEM Center recorded an average of 203 student check-ins every week. Weekly, Monday through Thursday, the STEM Center is hosting Hornets Tutoring group study sections for CHEM 107, 111A, 111B, MATH 140, 152, and PHYS 221. Every other week, STEM students attend club meetings for the Science Club, Physics Club, and Applied Engineering Club at the STEM Center. Full-time and part-time faculty in the Physics, Chemistry, and Biology departments have been holding weekly office hours in the space. Each semester, the STEM Center hosts numerous events and workshops for students, including 3D Printing, Undergraduate Research 101, Engineering Panel, Transfer 101, Bridge Building Competition, Arduino workshop, and

several MESA program events and workshops.

The goal for the STEM Center was to provide a “one-stop shop” with easy access to STEM and CTE counselors, tutors, faculty mentors, group advising and many more resources. In less than two semesters, the STEM Center has become a home to the MESA program on campus and has become a destination for STEM students and events on our campus.

SAP#2: Expanded facilities along with more full-time faculty and stockroom staff to support sustained expansion of Chemistry sections and reduce the time to completion for students

The laboratories and stockroom are essential to the healthy function of the Chemistry Department. The department hiring an additional Laboratory Technician has enabled the continued offering of large numbers of chemistry classes, the majority of which have some lab component.

In the time since our previous program review there has been a significant loss in full-time faculty, due to three retirements and two faculty transitioning into Dean roles. The department was fortunate enough to hire two replacement faculty in 2023, but the department is still operating with far fewer full-time faculty than are necessary to staff the large number of high demand classes in our department. Due to high demand, we continue to offer a large number of course offerings, but we currently only have 10 full-time faculty and 19 adjunct faculty, when we should ideally have 16 full-time faculty and a team of 12-14 adjuncts for the amount of classes we offer.

SAP#3: Bimonthly professional development seminars for chemistry adjunct faculty teaching pre-general chemistry (CHEM 107) and general chemistry (111A) courses.

The goals of SAP#3 were to improve student success, retention and persistence by offering training workshops (or seminars) to adjunct faculty teaching CHEM 107 and CHEM 111A. These two courses have been observed to have some of the lowest success rates in the chemistry program while also having the highest enrollment. Initially, the plan was to offer these workshops bimonthly, but the time commitment proved to be too much for the faculty member coordinating this effort. Just as importantly, it is difficult to run these workshops during the semester when adjunct faculty are often teaching at multiple campuses and have little time or availability in their schedules to attend.

Only one workshop was conducted during this last program review cycle in January of 2023. Many more had been planned, but for a number of reasons the workshops have been

put on hold until the next program review cycle. First, unbeknownst to the faculty coordinator, the SAP had only been approved for the first year instead of for four years. Moreover, there were complications with the paperwork for accessing program review funds for stipends and hospitality expenditures due to miscommunication between the faculty coordinator and the Natural Sciences Division Office along with, perhaps, other parties.

The protocols for using program review funds for implementing these workshops is not clear and more work will need to be done to have a clear-cut protocol in place so that stipends can be paid to adjunct faculty. To be more specific, it had been planned to pay stipends to attendees of these workshops at a \$55 / hour professional expert (PE) pay rate, but unbeknownst to the faculty coordinator, the District will only pay stipends to seminar attendees at a rate of \$25 / hour. In addition, hospitality funds were thought to have been approved for food and beverages for attendees, but after filing an order with Sedexo, it was later determined that hospitality is not fundable through program review funds. The stipend and hospitality issues came as a surprise to the faculty coordinator given that a \$55 / hour pay rate and hospitality were funded when the same workshops were conducted back in 2019 using Professional Development funding.

Despite the lower stipends and the hospitality paperwork snafu, 9 adjunct faculty attended the 2023 workshop. This was nearly half of all the adjunct faculty in the Chemistry Department at that time. Post workshop surveys showed the participants were generally happy with the experience and would be open to attending future workshops. More workshops would need to be done to see if success rates, persistence and degree completion rates are improved as a result.

SAP#4: Support for the Chemistry Department to participate in community outreach activities to promote both our program and Fullerton College.

This second SAP from our previous self-study was to support the Chemistry Department's efforts in participating in community outreach activities that promote both our program and Fullerton College. By engaging in community outreach, the Chemistry Department is creating partnerships and strengthening connections with local K-12, higher education institutions,

local civic organizations and local businesses. We are exposing individuals at an early age to scientific concepts so that when these students get to college, they are already excited about pursuing STEM-related disciplines. By engaging in the community, we are promoting science and Fullerton College to a wide variety of underserved communities. By promoting Fullerton College, we are creating a cultural hub for the local community. Fullerton College student volunteers serve as mentors and leaders to the younger K-12 students. These Fullerton College students serve as role models to the younger K-12 students, showing them that they too can become college students in the STEM fields. The chemistry department participated in several community outreach events in the last four years including KinderCaminata, National Chemistry Week Event at the Santa Ana Zoo and a STEM Open House event for the new STEM center.

SAP#5: Support for the Chemistry Department Laboratories and Chemical Stockroom

Additional laboratory equipment continues to allow the department to better serve our students in our laboratory courses. We continue to have high enrollments, which necessitates a large number of laboratory resources. Continuing to maintain our laboratory equipment allows us to provide excellent training for our students.

SAP#6: Peer Undergraduate Mentoring Program (PUMP)

PUMP, a mentoring program started in 2012, aimed to improve student retention and successful completion in Science, Technology, Engineering and Mathematics (STEM) courses. PUMP program paired first year Fullerton College STEM students with academically outstanding STEM students from California State University, Fullerton. Offering individualized peer mentoring has been beneficial to the STEM students at Fullerton College.

This program appears to no longer exist in its current form. In addition, the Chemistry faculty involved in this program are no longer at Fullerton and cannot share their insights.

SAP#7: Boot Camps

Chemistry boot camps are funded by Program Review and Project RAISE. Students who participate in boot camps have an increased retention and success rates in the Chemistry program. Students who participated in the program achieved higher levels of success compared to comparable students who did not attend (Please see data in Program Review 2017). The courses and number of students served in boot camps were expanded to include students in the STEM cohorts. The boot camps also Increased persistence of students in

Chemistry Program. As students achieve more success, they are more likely to persist in the program. In recent years, attendance at Boot Camps has been diminished, likely due to scheduling in the weeks prior to semesters starting. This can be improved by running boot camps once the semester has begun, but this becomes an additional burden on students' and faculty time. With several recent faculty retirements and a medical leave, and with dwindling attendance, it has been difficult to maintain boot camps without more faculty to share the burden.

SAP#8: Continue and Expand offering Hornets Tutoring for chemistry courses.

Hornets Tutoring has continued to be implemented in chemistry courses. Data for the 2016-2017 academic term show students that attended 5 or more tutoring sessions per semester had a 90.0% completion rate compared to those that did not participate (81.6%) and students in equivalent courses with no tutoring offered (83.8%). Students that attended 5 or more tutoring sessions per semester had a 77.3% success rate compared to those that did not participate (69.4%) and students in equivalent courses with no tutoring offered (71.1%). No data has been obtained since AY 16/17. Please see Program Review 2017 for data.

In the Fall 2025 semester, 8 out of 9 full-time faculty (our tenth is currently on medical leave) and an additional two adjunct faculty, have embedded Hornets Tutors in 13 courses. The value and desire for embedded tutors remains high. Maintaining continuity over multiple semesters can be difficult, though, due to tutors' changing schedules and their eventual transfer.

2. If additional funds were NOT allocated to you in the last review cycle, how did the LACK of funds have an impact on your program?

SAP #3 was funded for one year during the last review cycle, but since it was not funded for multiple years, only one adjunct faculty workshop was conducted.

SAP #4 Monies were requested to purchase items such as solid-phase extraction cartridges for separating mixtures of food dyes and also fluorescent rocks with UV-lamps for providing participants with great visuals and experience with sample analysis. It is unknown how much funding was received from the previous program review for this SAP. None of these items were purchased due to lack of funds. However, the department was able to purchase T-shirts with some monies. Some supplies garnered for this event have continued to be funded by other resources like KinderCaminata and National Chemistry Week annual events. Other supplies are still provided by the chemistry department's stockroom.

Biannual Adjunct Faculty Professional Development Workshops

Short Description:

This SAP involves the re-implementation of biannual professional development seminars designed to deliver instructional support to adjunct faculty who are interested in improving the legacy success rates of students leaving their courses, which in turn, leads to greater student persistence and higher rates of degree completion. These seminars are specifically designed to help instructors who teach pre-general chemistry (CHEM 107) and general chemistry (111A) courses, which have the highest enrollments combined with some of the lowest success rates within the chemistry program. The main focus of these seminars will be on specific topics that students typically struggle to understand and how to teach them more effectively. However, a discussion of some equity building blocks as it relates to syllabus design, grading polices, Canvas shell design, useful study techniques for students and creation of assessments for CHEM 107 and CHEM 111A will also be addressed.

Measurable Outcomes:

A. Increased number of students in chemistry program transferring B. Increased retention rate of students in chemistry program C. Increased success rate among students taking CHEM 107 or CHEM 111A D. Increased legacy success rate of students in our chemistry programs (i.e., success rates in CHEM 111B and beyond should improve as a result of better instruction in CHEM 107 and CHEM 111A). E. Increased persistence of students in chemistry program All of these metrics could specifically be applied to our Latina/o/x/e students who comprise the largest population of underrepresented students for degree completion based on data in section 2.2 of this program review document.

College Goals:

3.1 Reduce equity gaps in first year English/Math completion; 3.2 Reduce equity gaps in degree/certificate completion; 3.3 Reduce equity gaps in transfer attainment; 3.5 Increase participation in DEIAA focused professional development

SAP Phase:

In Progress

Resource Requests**Stipend for full-time faculty coordinator****Enhancement:**

This SAP involves the re-implementation of biannual professional development seminars designed to deliver instructional support to adjunct faculty who are interested in improving the legacy

success rates of students leaving their courses, which in turn, leads to greater student persistence and higher rates of degree completion. These seminars are specifically designed to help instructors who teach pre-general chemistry (CHEM 107) and general chemistry (111A) courses, which have the highest enrollments combined with some of the lowest success rates within the chemistry program. The main focus of these seminars will be on specific topics that students typically struggle to understand and how to teach them more effectively. However, a discussion of some equity building blocks as it relates to syllabus design, grading polices, Canvas shell design, useful study techniques for students and creation of assessments for CHEM 107 and CHEM 111A will also be addressed. A. Increased number of students in chemistry program transferring B. Increased retention rate of students in chemistry program C. Increased success rate among students taking CHEM 107 or CHEM 111A D. Increased legacy success rate of students in our chemistry programs (i.e., success rates in CHEM 111B and beyond should improve as a result of better instruction in CHEM 107 and CHEM 111A). E. Increased persistence of students in chemistry program All of these metrics could specifically be applied to our Latina/o/x/e students who comprise the largest population of underrepresented students for degree completion based on data in section 2.2 of this program review document. One full-time faculty coordinator: 30 hours (@ \$55 / hour) = \$1,650

Personnel-Related:

N/A

Resource Category:

Training

Quantity:

1

Unit Cost:

\$1,650.00

TotalCost:

\$1,650.00

Stipend for participating part-time faculty

Enhancement:

This SAP involves the re-implementation of biannual professional development seminars designed to deliver instructional support to adjunct faculty who are interested in improving the legacy success rates of students leaving their courses, which in turn, leads to greater student persistence and higher rates of degree completion. These seminars are specifically designed to help instructors who teach pre-general chemistry (CHEM 107) and general chemistry (111A) courses, which have the highest enrollments combined with some of the lowest success rates within the chemistry program. The main focus of these seminars will be on specific topics that students typically struggle to understand and how to teach them more effectively. However, a discussion of some

equity building blocks as it relates to syllabus design, grading polices, Canvas shell design, useful study techniques for students and creation of assessments for CHEM 107 and CHEM 111A will also be addressed. 10 part-time faculty participating: 80 hours (@ \$25 / hour) = \$2,000

Personnel-Related:

N/A

Resource Category:

Adjunct Faculty

Quantity:

10

Unit Cost:

\$200.00

TotalCost:

\$2,000.00

Support for the Chemistry Department to participate in community outreach activities to promote both our program and Fullerton College.

Short Description:

The Chemistry Department is committed to engaging in outreach activities, specifically, we aim to reach K-12 students by providing them with fun and interactive activities to get them enthusiastic about chemistry, which hopefully serves as a strong foundation for their future success as chemistry undergraduates here at FC. It is important to expose individuals at an early age to scientific concepts so that when these students get to college they are already excited about pursuing STEM-related disciplines. Our faculty and staff currently participate in numerous outreach events, both on- and off-campus such as our yearly STEM Open House, National Chemistry Week, KinderCaminata, and Family & High-School Senior Night, among others. In addition, we rely on enrolled FC student volunteers to provide them with opportunities to serve as mentors and leaders to younger K-12 students.

MeasurableOutcomes:

- Increased number of traditionally underrepresented students interested in majoring in chemistry
- Increased participation of local K-12 schools in outreach events
- Promoting our program and Fullerton College to our local community
- Provide FC students with opportunities to reach out to their local community

College Goals:

1.4 Reduce equity gap in Black/AA college enrollment; 1.5 Outreach strategies for prospective students/family

SAP Phase:

New

Resource Requests

Solid phase extraction cartridges for food dye separation hands-on activities

Enhancement:

The Chemistry Department is committed to engaging in outreach activities, specifically, we aim to reach K-12 students by providing them with fun and interactive activities to get them enthusiastic about chemistry, which hopefully serves as a strong foundation for their future success as chemistry undergraduates here at FC. It is important to expose individuals at an early age to scientific concepts so that when these students get to college they are already excited about pursuing STEM-related disciplines. Our faculty and staff currently participate in numerous outreach events, both on- and off-campus such as our yearly STEM Open House, National Chemistry Week, KinderCaminata, and Family & High-School Senior Night, among others. In addition, we rely on enrolled FC student volunteers to provide them with opportunities to serve as mentors and leaders to younger K-12 students. Solid phase extraction cartridges for food dye separation hands-on activities C18-E stationary phase, 2 g sorbent mass: 2 boxes (@ \$200/box) = \$400 Phenyl stationary phase, 1 g sorbent mass: 1 box (@ \$200/box) = \$200 Vacuum adapter caps for 1 g cartridges: 2 packs (@ \$50 / pack) = \$100 Vacuum adapter caps for 2 g cartridges: 2 packs (@ \$50 / pack) = \$100 A Fluorescent Rock Set : \$814 Short-wave UV lamp: 2 lamps (@ \$379 / lamp) = \$758 UV-protective glasses: 16 pairs (\$8 / pair) = \$128

Personnel-Related:

N/A

Resource Category:

Equipment

Quantity:

1

Unit Cost:

~~\$2,500.00~~
~~Total Cost:~~
\$2,500.00

T-shirts for events

Enhancement:

The Chemistry Department is committed to engaging in outreach activities, specifically, we aim to reach K-12 students by providing them with fun and interactive activities to get them enthusiastic about chemistry, which hopefully serves as a strong foundation for their future success as chemistry undergraduates here at FC. It is important to expose individuals at an early age to scientific concepts so that when these students get to college they are already excited about pursuing STEM-related disciplines. Our faculty and staff currently participate in numerous outreach events, both on- and off-campus such as our yearly STEM Open House, National Chemistry Week, KinderCaminata, and Family & High-School Senior Night, among others. In addition, we rely on enrolled FC student volunteers to provide them with opportunities to serve as mentors and leaders to younger K-12 students. T-shirts for events: 60 t-shirts (@ \$10 / t-shirt) = \$600 over 3 years.

Personnel-Related:

N/A

Resource Category:

Supplies

Quantity:

60

Unit Cost:

\$10.00

TotalCost:

\$600.00

Fluorescent bracelet/necklace beads

Enhancement:

The Chemistry Department is committed to engaging in outreach activities, specifically, we aim to reach K-12 students by providing them with fun and interactive activities to get them enthusiastic about chemistry, which hopefully serves as a strong foundation for their future success as chemistry undergraduates here at FC. It is important to expose individuals at an early age to scientific concepts so that when these students get to college they are already excited about pursuing STEM-related disciplines. Our faculty and staff currently participate in numerous outreach events, both on- and off-campus such as our yearly STEM Open House, National Chemistry Week, KinderCaminata, and Family & High-School Senior Night, among others. In addition, we rely on enrolled FC student volunteers to provide them with opportunities to serve as mentors and leaders to younger K-12 students. Fluorescent bracelet/necklace beads: \$250 over 3 years.

Personnel-Related:

N/A

Resource Category:

Supplies

Quantity:

1

Unit Cost:

\$250.00

TotalCost:

\$250.00

Miscellaneous Supplies**Enhancement:**

The Chemistry Department is committed to engaging in outreach activities, specifically, we aim to reach K-12 students by providing them with fun and interactive activities to get them enthusiastic about chemistry, which hopefully serves as a strong foundation for their future success as chemistry undergraduates here at FC. It is important to expose individuals at an early age to scientific concepts so that when these students get to college they are already excited about pursuing STEM-related disciplines. Our faculty and staff currently participate in numerous outreach events, both on- and off-campus such as our yearly STEM Open House, National Chemistry Week, KinderCaminata, and Family & High-School Senior Night, among others. In addition, we rely on enrolled FC student volunteers to provide them with opportunities to serve as mentors and leaders to younger K-12 students. Miscellaneous items TBD: \$450 over 3 years

Personnel-Related:

N/A

Resource Category:

Supplies

Quantity:

1

Unit Cost:

\$450.00

TotalCost:

\$450.00

Laptop for hands-on graphing activities**Enhancement:**

The Chemistry Department is committed to engaging in outreach activities, specifically, we aim to reach K-12 students by providing them with fun and interactive activities to get them enthusiastic

about chemistry, which hopefully serves as a strong foundation for their future success as chemistry undergraduates here at FC. It is important to expose individuals at an early age to scientific concepts so that when these students get to college they are already excited about pursuing STEM-related disciplines. Our faculty and staff currently participate in numerous outreach events, both on- and off-campus such as our yearly STEM Open House, National Chemistry Week, KinderCaminata, and Family & High-School Senior Night, among others. In addition, we rely on enrolled FC student volunteers to provide them with opportunities to serve as mentors and leaders to younger K-12 students. Laptop for hands-on graphing activities: 2 (@ \$1350 ea.) = \$2700

Personnel-Related:

N/A

Resource Category:

Computer Hardware

Quantity:

2

Unit Cost:

\$1,350.00

TotalCost:

\$2,700.00

Graphing Package

Enhancement:

The Chemistry Department is committed to engaging in outreach activities, specifically, we aim to reach K-12 students by providing them with fun and interactive activities to get them enthusiastic about chemistry, which hopefully serves as a strong foundation for their future success as chemistry undergraduates here at FC. It is important to expose individuals at an early age to scientific concepts so that when these students get to college they are already excited about pursuing STEM-related disciplines. Our faculty and staff currently participate in numerous outreach events, both on- and off-campus such as our yearly STEM Open House, National Chemistry Week, KinderCaminata, and Family & High-School Senior Night, among others. In addition, we rely on enrolled FC student volunteers to provide them with opportunities to serve as mentors and leaders to younger K-12 students. graphing package: 2 (@ \$100 ea.) = \$200

Personnel-Related:

N/A

Resource Category:

Computer Software

Quantity:

2

Unit Cost:

\$200.00

Total Cost:

\$400.00

Support for the Chemistry Department Laboratories and Chemical Stockroom

Short Description:

The Chemical Stockroom is an essential component of the Chemistry Department. The Chemical Stockroom is responsible for the procurement and preparation of chemicals for use in the chemistry laboratories, and the maintenance and purchase of equipment that are commonly used in chemistry experiments and demonstrations. Additionally, every community event in which the Chemistry Department is engaged (e.g., National Chemistry Week, Kinderaminata and Open House celebrations) requires support from the Chemical Stockroom. To ensure that the Chemical Stockroom is well-equipped to support the Chemistry Department as it offers a growing number of courses and participates in community events, the following resources are requested: 1- GC/MS \$150,000.00 used - \$250,000+ New 10 - new hot plates \$ 10,000.00 20 Organic Micro Kits \$20,000.00 1- Atago 1211 Abbe Refractometer, for liquids, 100-240 VAC \$7,561.00 or <https://www.coleparmer.com/i/cole-parmer-digital-refractometer-0-85-brix-1-3330-1-5100-ri/8115055> 3 - Flatbed recorder for the GC (No price available) 10 - LabQuest III and Spectro Vis \$8,780.00 (backup) 2 Fisher Scientific 10 x 10 Iso-temp 30°C to 400°C Ceramic Top Hot Plate Stirrer, Cat. No. 11-102-100SH \$1,600.00 8 – Atomic self-setting wall clocks for lab \$900.00 Titration glassware and equipment: 50mL burets, Single buret clamps, and double buret clamps. \$15,000.00 30 Vacuum flask \$10,00.00 25 Chromebooks and a storage cart with a built-in charger \$6,500.00

Measurable Outcomes:

Increased number of students in chemistry program transferring Increased retention rate of students in chemistry program Increased success rate of students in chemistry program
Increased persistence of students in chemistry program Increased number of Chemistry Associate in Arts and Associate in Science degrees Increased participation in community events

College Goals:

1.3 Night, weekend, online degree program; 1.5 Outreach strategies for prospective students/family;
2.1 Equitable support services in Dual/Online/Night/Weekend; 2.2 Increase access/usage of Basic Needs; 2.3 Increase access to affordable course materials; 3.2 Reduce equity gaps in

degree/certificate completion; 3.3 Reduce equity gaps in transfer attainment

SAP Phase:

In Progress

Resource Requests

Gas Chromatograph-Mass Spectrometer

Enhancement:

The Chemical Stockroom is an essential component of the Chemistry Department. The Chemical Stockroom is responsible for the procurement and preparation of chemicals for use in the chemistry laboratories, and the maintenance and purchase of equipment that are commonly used in chemistry experiments and demonstrations. Additionally, every community event in which the Chemistry Department is engaged (e.g., National Chemistry Week, Kindercaminata and Open House celebrations) requires support from the Chemical Stockroom. To ensure that the Chemical Stockroom is well-equipped to support the Chemistry Department as it offers a growing number of courses and participates in community events, the following resources are requested: Mass Spectrometry is an analytical technique that provides mass and structural information about molecules. Gas chromatography-mass spectrometry is a common combination used in the analysis of chemical samples in many fields, such as medicine, food and drug analysis, environmental monitoring, forensics and law enforcement, security, etc. Training in MS prepares students in chemistry classes to work with modern analytical equipment. GC/MS \$150,000.00 used \$250,000+ New

Personnel-Related:

N/A

Resource Category:

Equipment

Quantity:

1

Unit Cost:

\$150,000.00

TotalCost:

\$150,000.00

New Hot plates

Enhancement:

The Chemical Stockroom is an essential component of the Chemistry Department. The Chemical Stockroom is responsible for the procurement and preparation of chemicals for use in the

chemistry laboratories, and the maintenance and purchase of equipment that are commonly used in chemistry experiments and demonstrations. Additionally, every community event in which the Chemistry Department is engaged (e.g., National Chemistry Week, Kindercaminata and Open House celebrations) requires support from the Chemical Stockroom. To ensure that the Chemical Stockroom is well-equipped to support the Chemistry Department as it offers a growing number of courses and participates in community events, the following resources are requested:

Personnel-Related:

N/A

Resource Category:

Equipment

Quantity:

10

Unit Cost:

\$1,000.00

TotalCost:

\$10,000.00

Organic Micro Kits

Enhancement:

The Chemical Stockroom is an essential component of the Chemistry Department. The Chemical Stockroom is responsible for the procurement and preparation of chemicals for use in the chemistry laboratories, and the maintenance and purchase of equipment that are commonly used in chemistry experiments and demonstrations. Additionally, every community event in which the Chemistry Department is engaged (e.g., National Chemistry Week, Kindercaminata and Open House celebrations) requires support from the Chemical Stockroom. To ensure that the Chemical Stockroom is well-equipped to support the Chemistry Department as it offers a growing number of courses and participates in community events, the following resources are requested:

Personnel-Related:

N/A

Resource Category:

Equipment

Quantity:

20

Unit Cost:

\$1,000.00

TotalCost:

\$20,000.00

Atago 1211 Abbe Refractometer, for liquids, 100-240 VAC**Enhancement:**

The Chemical Stockroom is an essential component of the Chemistry Department. The Chemical Stockroom is responsible for the procurement and preparation of chemicals for use in the chemistry laboratories, and the maintenance and purchase of equipment that are commonly used in chemistry experiments and demonstrations. Additionally, every community event in which the Chemistry Department is engaged (e.g., National Chemistry Week, Kindercaminata and Open House celebrations) requires support from the Chemical Stockroom. To ensure that the Chemical Stockroom is well-equipped to support the Chemistry Department as it offers a growing number of courses and participates in community events, the following resources are requested:

Personnel-Related:

N/A

Resource Category:

Equipment

Quantity:

1

Unit Cost:~~\$7,561.00~~

\$7,561.00

Flatbed Chart Recorder for GC**Enhancement:**

The Chemical Stockroom is an essential component of the Chemistry Department. The Chemical Stockroom is responsible for the procurement and preparation of chemicals for use in the chemistry laboratories, and the maintenance and purchase of equipment that are commonly used in chemistry experiments and demonstrations. Additionally, every community event in which the Chemistry Department is engaged (e.g., National Chemistry Week, Kindercaminata and Open House celebrations) requires support from the Chemical Stockroom. To ensure that the Chemical Stockroom is well-equipped to support the Chemistry Department as it offers a growing number of courses and participates in community events, the following resources are requested:

Personnel-Related:

N/A

Resource Category:

Equipment

Quantity:

3

Unit Cost:~~\$1,215.20~~**Total Cost:**

\$3,645.60

LabQuest III and Spectro Vis**Enhancement:**

The Chemical Stockroom is an essential component of the Chemistry Department. The Chemical Stockroom is responsible for the procurement and preparation of chemicals for use in the chemistry laboratories, and the maintenance and purchase of equipment that are commonly used in chemistry experiments and demonstrations. Additionally, every community event in which the Chemistry Department is engaged (e.g., National Chemistry Week, Kindercaminata and Open House celebrations) requires support from the Chemical Stockroom. To ensure that the Chemical Stockroom is well-equipped to support the Chemistry Department as it offers a growing number of courses and participates in community events, the following resources are requested:

Personnel-Related:

N/A

Resource Category:

Equipment

Quantity:

10

Unit Cost:

\$878.00

Total Cost:

\$8,780.00

Fisher Scientific 10 x 10 Iso-temp 30°C to 400°C Ceramic Top Hot Plate Stirrer, Cat. No. 11-102-100SH**Enhancement:**

The Chemical Stockroom is an essential component of the Chemistry Department. The Chemical Stockroom is responsible for the procurement and preparation of chemicals for use in the chemistry laboratories, and the maintenance and purchase of equipment that are commonly used

in chemistry experiments and demonstrations. Additionally, every community event in which the Chemistry Department is engaged (e.g., National Chemistry Week, Kindercaminata and Open House celebrations) requires support from the Chemical Stockroom. To ensure that the Chemical Stockroom is well-equipped to support the Chemistry Department as it offers a growing number of courses and participates in community events, the following resources are requested:

Personnel-Related:

N/A

Resource Category:

Equipment

Quantity:

2

Unit Cost:

\$800.00

TotalCost:

\$1,600.00

Atomic self-setting wall clocks for lab

Enhancement:

The Chemical Stockroom is an essential component of the Chemistry Department. The Chemical Stockroom is responsible for the procurement and preparation of chemicals for use in the chemistry laboratories, and the maintenance and purchase of equipment that are commonly used in chemistry experiments and demonstrations. Additionally, every community event in which the Chemistry Department is engaged (e.g., National Chemistry Week, Kindercaminata and Open House celebrations) requires support from the Chemical Stockroom. To ensure that the Chemical Stockroom is well-equipped to support the Chemistry Department as it offers a growing number of courses and participates in community events, the following resources are requested:

Personnel-Related:

N/A

Resource Category:

Equipment

Quantity:

8

Unit Cost:

\$112.50

TotalCost:

\$900.00

Titration glassware and equipment

Enhancement:

The Chemical Stockroom is an essential component of the Chemistry Department. The Chemical Stockroom is responsible for the procurement and preparation of chemicals for use in the chemistry laboratories, and the maintenance and purchase of equipment that are commonly used in chemistry experiments and demonstrations. Additionally, every community event in which the Chemistry Department is engaged (e.g., National Chemistry Week, Kindercaminata and Open House celebrations) requires support from the Chemical Stockroom. To ensure that the Chemical Stockroom is well-equipped to support the Chemistry Department as it offers a growing number of courses and participates in community events, the following resources are requested: 50mL burets, Single buret clamps, and double buret clamps.

Personnel-Related:

N/A

Resource Category:

Equipment

Quantity:

1

Unit Cost:

\$15,000.00

TotalCost:

\$15,000.00

Vacuum Flask

Enhancement:

The Chemical Stockroom is an essential component of the Chemistry Department. The Chemical Stockroom is responsible for the procurement and preparation of chemicals for use in the chemistry laboratories, and the maintenance and purchase of equipment that are commonly used in chemistry experiments and demonstrations. Additionally, every community event in which the Chemistry Department is engaged (e.g., National Chemistry Week, Kindercaminata and Open House celebrations) requires support from the Chemical Stockroom. To ensure that the Chemical Stockroom is well-equipped to support the Chemistry Department as it offers a growing number of courses and participates in community events, the following resources are requested:

Personnel-Related:

N/A

Resource Category:

Equipment

Quantity:

30

Unit Cost:

\$333.33

Total Cost:

\$9,999.90

Chromebooks and storage cart with built-in charger**Enhancement:**

The Chemical Stockroom is an essential component of the Chemistry Department. The Chemical Stockroom is responsible for the procurement and preparation of chemicals for use in the chemistry laboratories, and the maintenance and purchase of equipment that are commonly used in chemistry experiments and demonstrations. Additionally, every community event in which the Chemistry Department is engaged (e.g., National Chemistry Week, Kindercaminata and Open House celebrations) requires support from the Chemical Stockroom. To ensure that the Chemical Stockroom is well-equipped to support the Chemistry Department as it offers a growing number of courses and participates in community events, the following resources are requested: 25 chromebooks and storage cart with built-in charger

Personnel-Related:

N/A

Resource Category:

Computer Hardware

Quantity:

1

Unit Cost:

\$6,500.00

Total Cost:

\$6,500.00

Permanently Fund the STEM Center and MESA Personnel**Short Description:**

Recently, the California Community Colleges Board of Governors formally established the

Mathematics, Engineering, Science Achievement (MESA) Program in the California Community Colleges. The adopted and approved regulations formally codified MESA within title 5, establishing a clear and consistent statewide framework that honors the program's proven 55 years of California MESA history while positioning it for continued growth and innovation. College districts have up to 180 days from the effective date—until April 26, 2026—to bring local policies and procedures into alignment with the regulatory MESA Program requirements. Importantly, districts receiving MESA funding must locally ensure that programs are adequately staffed and supported. Although MESA funds will no longer be a competitive grant cycle application, we will not have sufficient MESA funding beginning July 1, 2027 for staff salaries. The \$280,000 per year of MESA funds are insufficient to cover both the required student components (e.g., MESA field trips, conferences, honorariums for student STEM internships/experiential learning opportunities, guest speakers, MESA Counselor, MESA tutors, MESA peer mentors, PE(s), workshops, supplies, and equipment) of the program and staff salaries. The new regulations ensure that MESA's mission—to cultivate diverse talent in STEM, expand transfer opportunities, and close long-standing equity gaps—is now embedded in the structure of the community college system itself. They strengthen local capacity, affirm MESA as a vital instrument of Vision 2030. With the above in mind, the following is needed to support the MESA and STEM Center staff salaries: Carlos Aguirre - Director, Academic Support Programs (MESA): (\$165,460 salary) + (\$3,500 doctoral stipend) + (\$2,646.10 fringe benefits) + (\$61,091.77 benefits) = \$232,697.87 Stephanie Cheung - Administrative Assistant II: (\$6,617 x 12 months) + (\$2,646.10 fringe benefits) + (\$29,209.84 benefits) = \$111,259.94

Measurable Outcomes:

- Increased number of STEM degrees/certificates - Increased number of STEM majors transferring - Increased recruitment of underrepresented groups to STEM majors - Increased success rate of STEM students - Increased persistence and retention of STEM students - Increased number of students attending tutoring and SI sessions - Creation of a STEM Alumni Network - Increased placement of students in research and internship programs - Increased opportunities for students to participate in community service - Increase the amount of grant money to support student/faculty research opportunities - Greater connectivity and partnerships with area STEM industries - More interdisciplinary coordination among STEM departments

College Goals:

1.2. Increase equitable usage of apprenticeship/internship; 1.4 Reduce equity gap in Black/AA college enrollment; 1.5 Outreach strategies for prospective students/family; 2.2 Increase access/usage of Basic Needs; 2.3 Increase access to affordable course materials; 2.4 Increase access to academic support in course with DI; 2.6 Reduce equity gap in persistence for Black/AA students; 3.2 Reduce equity gaps in degree/certificate completion; 3.3 Reduce equity gaps in transfer attainment; 3.4 Increase collaboration with universities; 3.5 Increase participation in DEIAA focused professional development

SAP Phase:

In Progress

Resource Requests

Director, Academic Support Programs (MESA)

Enhancement:

Recently, the California Community Colleges Board of Governors formally established the Mathematics, Engineering, Science Achievement (MESA) Program in the California Community Colleges. The adopted and approved regulations formally codified MESA within title 5, establishing a clear and consistent statewide framework that honors the program's proven 55 years of California MESA history while positioning it for continued growth and innovation. College districts have up to 180 days from the effective date—until April 26, 2026—to bring local policies and procedures into alignment with the regulatory MESA Program requirements. Importantly, districts receiving MESA funding must locally ensure that programs are adequately staffed and supported. (\$165,460 salary) + (\$3,500 doctoral stipend) + (\$2,646.10 fringe benefits) + (\$61,091.77 benefits) = \$232,697.87

Personnel-Related:

Although MESA funds will no longer be a competitive grant cycle application, we will not have sufficient MESA funding beginning July 1, 2027 for staff salaries. The \$280,000 per year of MESA funds are insufficient to cover both the required student components (e.g., MESA field trips, conferences, honorariums for student STEM internships/experiential learning opportunities, guest speakers, MESA Counselor, MESA tutors, MESA peer mentors, PE(s), workshops, supplies, and equipment) of the program and staff salaries.

Resource Category:

Non-Faculty Personnel

Quantity:

1

Unit Cost:

\$232,697.87

Total Cost:

\$232,697.87

Administrative Assistant II

Enhancement:

Recently, the California Community Colleges Board of Governors formally established the Mathematics, Engineering, Science Achievement (MESA) Program in the California Community Colleges. The adopted and approved regulations formally codified MESA within title 5, establishing a clear and consistent statewide framework that honors the program's proven 55 years of California MESA history while positioning it for continued growth and innovation. College

districts have up to 180 days from the effective date—until April 26, 2026—to bring local policies and procedures into alignment with the regulatory MESA Program requirements. Importantly, districts receiving MESA funding must locally ensure that programs are adequately staffed and supported. Administrative Assistant II: (\$6,617 x 12 months) + (\$2,646.10 fringe benefits) + (\$29,209.84 benefits) = \$111,259.94

Personnel-Related:

Although MESA funds will no longer be a competitive grant cycle application, we will not have sufficient MESA funding beginning July 1, 2027 for staff salaries. The \$280,000 per year of MESA funds are insufficient to cover both the required student components (e.g., MESA field trips, conferences, honorariums for student STEM internships/experiential learning opportunities, guest speakers, MESA Counselor, MESA tutors, MESA peer mentors, PE(s), workshops, supplies, and equipment) of the program and staff salaries.

Resource Category:

Non-Faculty Personnel

Quantity:

1

Unit Cost:

\$111,259.94

TotalCost:

\$111,259.94

Hornets Tutoring for Chemistry Courses

Short Description:

Data from the previous Program Review (2017) showed Hornets Tutoring had a positive impact on students that participated (Section 5.3.6). Traditionally, all chemistry Hornets Tutoring courses have been funded by Equity funds but funding is uncertain. To ensure that we are able to continue offering Hornets Tutoring sessions to improve student retention and success, a more stable source of funding is sought. Hornet's Tutoring has had a decreased budget, but the program is still in high demand. Support for 13 Hornet Tutors per semester is requested to help support our current level of implementation, with a desire to continue increasing the number of courses with Hornet Tutors (\$17/hour, 12 hours/week, 14 weeks/semester, \$5712/year a student)

MeasurableOutcomes:

Hornets Tutoring, incorporated into many of the difficult chemistry courses will increase course success and retention, and the persistence rate of students. This will lead to an increase in course completions, degrees and transfer in Chemistry. In addition, it will increase the number of students

participating in STEM activities. Pre- and post-surveys of student's perspective on the program
Increased retention rate of students in the Chemistry Program
Increased success rate of students in the Chemistry Program
Increased persistence through the course sequence
Increased number of students transferring

College Goals:

1.2. Increase equitable usage of apprenticeship/internship; 2.1 Equitable support services in Dual/Online/Night/Weekend; 2.2 Increase access/usage of Basic Needs; 2.4 Increase access to academic support in course with DI; 2.6 Reduce equity gap in persistence for Black/AA students; 3.2 Reduce equity gaps in degree/certificate completion; 3.3 Reduce equity gaps in transfer attainment

SAP Phase:

In Progress

Resource Requests

Hornets Tutors

Enhancement:

Data from the previous Program Review (2017) showed Hornets Tutoring had a positive impact on students that participated (Section 5.3.6). Traditionally, all chemistry Hornets Tutoring courses have been funded by Equity funds but funding is uncertain. To ensure that we are able to continue offering Hornets Tutoring sessions to improve student retention and success, a more stable source of funding is sought.

Personnel-Related:

Hornet's Tutoring has had a decreased budget, but the program is still in high demand. Support for 13 Hornet Tutors per semester is requested to help support our current level of implementation, with a desire to continue increasing the number of courses with Hornet Tutors (\$17/hour, 12 hours/week, 14 weeks/semester, \$5712/year a student)

Resource Category:

Non-Faculty Personnel

Quantity:

13

Unit Cost:

\$5,712.00

Total Cost:

\$74,256.00

Continue offering Boot Camps for students in chemistry courses

Short Description:

Prior to the start of the semester, students are invited to attend a free intensive review session for CHEM 107 F, 111AF, 111BF, 201 F, and 211AF courses. Topics covered in these sessions include entry level skills and laboratory techniques essential to success in the course. Each boot camp lasts several days, between 6-12 total hours. Faculty are paid to provide instruction and individualized help with computations and lab skills. The total number of hours requested per semester is 30 hours max per year per instructor for instruction and preparation. And, an additional 15 hour/year for the administrator of the boot camps. Faculty are paid as professional experts at a rate of \$55/hour. With the lack of laboratory, learning, writing, and studying skills more apparent post pandemic, it is crucial to keep the Boot Camps going for the students enrolled in most chemistry courses. Faculty are paid to provide instruction and individualized help with computations and lab skills to students prior to the start of each semester, outside of faculty contract. Faculty are paid as professional experts at a rate of \$55/hour. The total number of hours requested per semester is between 45-55 hours of instruction, with 10-15 hours of preparation/set up. With the lack of laboratory, learning, writing, and studying skills more apparent post pandemic, it is crucial to keep the Boot Camps going for the students enrolled in most chemistry courses.

Measurable Outcomes:

These boot camps not only provide additional training for students, but they also give them a place where they can start to form connections with faculty and other students in their learning community. Giving the students tools to learn chemistry as well as place to belong will address the learning gaps that disproportionately impacted students have coming into our chemistry courses as well as give them a better sense of belonging. In addition, some faculty like to incorporate time-management skills into their boot camps. This will help to increase persistence and success rates for disproportionately impacted students in the Chemistry Program. Pre- and post-surveys of student's perspective on the program showed increased retention rate of students in the Chemistry Program, increased success rate of students in the Chemistry Program, increased persistence through the course sequence, and increased number of students transferring. Offering the Boot Camps will improve student critical thinking skills, increase the completion of courses, certificates, and degree programs, and transfer-readiness. It will remove institutional barriers to student equity and success and foster a sense of belonging where all are welcome. This follows the college mission in which Fullerton College strives to promote success for every student and will cultivate a culture of equity.

College Goals:

2.1 Equitable support services in Dual/Online/Night/Weekend; 2.2 Increase access/usage of Basic Needs; 2.4 Increase access to academic support in course with DI; 2.6 Reduce equity gap in persistence for Black/AA students; 3.2 Reduce equity gaps in degree/certificate completion; 3.3 Reduce equity gaps in transfer attainment

SAP Phase:

Completed

Resource Requests

Professional Expert pay for full-time faculty to teach Boot Camps

Enhancement:

Prior to the start of the semester, students are invited to attend a free intensive review session for CHEM 107 F, 111AF, 111BF, 201 F, and 211AF courses. Topics covered in these sessions include entry level skills and laboratory techniques essential to success in the course. Each boot camp lasts several days, between 6-12 total hours. Faculty are paid to provide instruction and individualized help with computations and lab skills. The total number of hours requested per semester is 30 hours max per year per instructor for instruction and preparation. And, an additional 15 hour/year for the administrator of the boot camps. Faculty are paid as professional experts at a rate of \$55/hour. With the lack of laboratory, learning, writing, and studying skills more apparent post pandemic, it is crucial to keep the Boot Camps going for the students enrolled in most chemistry courses.

Personnel-Related:

Faculty are paid to provide instruction and individualized help with computations and lab skills to students prior to the start of each semester, outside of faculty contract. Faculty are paid as professional experts at a rate of \$55/hour. The total number of hours requested per semester is between 45-55 hours of instruction, with 10-15 hours of preparation/set up. With the lack of laboratory, learning, writing, and studying skills more apparent post pandemic, it is crucial to keep the Boot Camps going for the students enrolled in most chemistry courses.

Resource Category:

Non-Faculty Personnel

Quantity:

4

Unit Cost:

\$12,000.00

TotalCost:

\$48,000.00

Resource Requests

ACS Essentials of Lab Safety for Instructors and TAs

Enhancement:

The Chemistry Department is requesting the Laboratory Safety Training Software program for all

chemistry faculty through the American Chemical Society. The goal is for all faculty to have current certifications in laboratory safety training. The faculty will participate in the online training once every three years. In addition, any adjunct faculty that is hired will also participate in the training. This will increase the safety awareness of the faculty which will lead to a safer and more productive laboratory experience for the students. The goal of this resource is to enhance the learning process and increase the retention and success rates of the students in the Chemistry program. This aligns with the College Mission to promote success for every student and commit to continuous quality improvement. Cost of program is \$1863.00/year

Personnel-Related:

N/A

Resource Category:

Training

Quantity:

3

Unit Cost:

\$1,863.00

TotalCost:

\$5,589.00

Labster

Enhancement:

The Chemistry Department is requesting support to improve student success and retention through providing classroom instructional resource of Labster simulations. With the pandemic came a new way of learning. Part of that was laboratory and content simulations. These provide a new way for students to learn content in their chemistry courses with the goal of increasing the success and retention rates of students in the Chemistry program. Labster allows a dynamic visualization of chemical reactions, chemical concepts, laboratory techniques, and others so that students can practice and obtain a better understanding of those concepts. In a virtual setting, the students can become familiar with material before they enter the lecture or laboratory class. We would like to use it as a tool to bridge the gap between theory and practice. The goal of this resource is to enhance the learning process and increase the retention and success rates of the students in the Chemistry program. This aligns with the College Mission to promote success for every student and commit to continuous quality improvement. \$28,381.00/year (labster rate \$36.20/license/student, 392 licences/semester for 16 sections)

Personnel-Related:

N/A

Resource Category:

Computer Software

Quantity:

3

Unit Cost:

\$28,381.00

TotalCost:

\$85,143.00

ChemDraw License

Enhancement:

ChemDraw is an industry leader in chemical structure drawing. It is used by students and professionals to draw chemical structures for inclusion in presentations, posters, scientific journals, exams, worksheets and other digital communications. Access to ChemDraw on campus allows students to use a professional tool during their education, which will prepare them for further education and careers in STEM fields.

Personnel-Related:

N/A

Resource Category:

Computer Software

Quantity:

3

Unit Cost:

\$5,000.00

TotalCost:

\$15,000.00