

Foothill Comprehensive Program Review 2024-25

Instructional Discipline Template

Instructional Discipline Template 2024

A. Program Information

Program Mission Statement

Please enter your mission statement here.

The chemistry department's mission is to provide students of all backgrounds with a strong foundation in the theoretical, experimental, and applied areas of chemistry through our integrated lecture and hands-on lab curriculum. To prepare our students for successful entry into 1) a four-year university, 2) an allied health program, or 3) professional school. To support the college mission, we develop students' analytical reasoning, collaborative learning, informational literacy, and critical thinking skills to help them become informed global citizens and achieve their future goals.

B. Enrollment Trends

Enrollment Variables and Trends

Enrollment Trends For Program Review

Enrollment Trends						
Science Tech Engin & Math - Chemistry-FD						
	2019-20	2020-21	2021-22	2022-23	2023-24	5-yr %Inc
Unduplicated Headcount	1,926	2,360	1,732	1,479	1,618	-16.0%
Enrollment	2,966	3,400	2,565	2,212	2,448	-17.5%
Sections	110	119	103	91	90	-18.2%
WSCH	7,155	8,349	6,303	5,386	5,968	-16.6%
FTES (end of term)	483	564	425	363	402	-16.8%
FTEF (end of term)	15.0	16.0	14.5	12.5	12.1	-19.9%
Productivity (WSCH/FTEF)	476	521	434	431	495	4.1%

B.1 - FTES

Goals: What is your program's goal with respect to FTES?

Increase and stabilize FTES to at least 2021-22 levels (~425).

Observation & Inferences: What do you observe in the data above in relation to your goals? What do you want the college to understand about the FTES in your program?

Our department FTES is consistent with collegewide trends. The FTES for the chemistry department has overall decreased 17% since 2019-20, matching a college-wide decrease of 17%. However, our FTES has been steadily increasing over the last two years. The estimated FTES for fall 2024 is 125 which is 8% higher than that for fall 2023 (117), in line with the 6% increase in FTES college-wide over the same time frame.

Action: What actions does your program plan to take in order to achieve your goals?

Last year, we had to turn away a total of 93 waitlisted students due to not having enough course offerings to accommodate them. We would like to create a space for all students interested in enrolling in a chemistry course series at Foothill College, including waitlisted students. We will continue to use student-centered course scheduling practices, including offering hybrid courses for the CHEM 1, 25, and 30 programs, optimizing time blocks to maximize enrollment, and coordinating with the biology and physics department to minimize course

conflicts across the chemistry and biology programs.. We will also continue to frame our course offerings around historical and anticipated student demand. Finally, our dual enrollment course offerings continue to attract interest and may be a source of continued growth.

Needs: What does your program need to execute this action plan?

We need to offer an appropriate number of sections to meet student demand including scheduling additional sections beyond historical enrollment. The current strategy of offering sections based on historical enrollment and then only offering additional sections once a waitlist is full is problematic as it is usually not possible to staff a last-minute addition to the schedule.

Chemistry students frequently remain at Foothill throughout their two-year major preparation. If we lower the number of courses early in the sequence, this lowers enrollment in all downstream courses. More importantly, we must honor our obligation to our students to provide a pathway for transfer. We need to commit to offering terminal courses such as CHEM 1C and CHEM 12C. If we begin a sequence, we cannot cancel the only remaining section of terminal courses under any circumstances as this practice comes at a tremendous cost to our students and destroys trust.

B.2 - Sections

Goals: What is your program's goal with respect to sections?

Increase the number of sections to at least 2021-22 levels (~100 sections per year). We also would like to offer more single sections so that we can most effectively serve our students and provide them with the time and support that they need to be successful.

Observation & Inferences: What do you observe in the data above in relation to your goals? What do you want the college to understand about the sections in your program?

We have significantly reduced the number of sections over the past decade to meet the productivity and budget targets provided by the college. This has resulted in a decrease from 115 sections in 2016-17 to 90 sections in 2023-24; we are also on track to offer 90 sections in 2024-25.

Action: What actions does your program plan to take in order to achieve your goals?

As stated above, we plan to be strategic and proactive in our course offerings to not only meet demand but also to provide opportunities for enrollment growth. It is clear there is increased student interest in CHEM 1A, CHEM 12A, CHEM 25, and CHEM 30A compared to previous years. We feel it is important to target enrollment in introductory courses and the first course in a course series because students often will stay at Foothill throughout the full course series once they've enrolled in the first course of that series. Being reactive by waiting for demand to emerge in waitlists and then offering additional sections gives rise to staffing issues; in addition, waitlisted students will have set their schedules with other classes and may not be able to enroll in a newly opened section.

Needs: What does your program need to execute this action plan?

We need to generally be able to offer additional sections when building schedules beyond historical demand. It has been demonstrated that an enrollment strategy in which course offerings are initially reduced and subsequently added back at the eleventh hour is not effective.

B.3 - Productivity

Goals: What is your program's goal with respect to productivity?

We aim to maintain roughly the same level of productivity as in the previous academic year. (470-500)

Observation & Inferences: What do you observe in the data above in relation to your goals? What do you want the college to understand about the productivity in your program?

Lab science courses have typically had lower productivity than courses in other disciplines due to smaller class sizes and laboratory safety considerations, and a higher number of instructor contact hours. We have increased our productivity by 4% since 2019-20, mostly due to eliminating evening single sections for some programs and consolidating two relatively low-enrollment sections of a double course into a single section. Overall though, the trend for productivity in chemistry has been parallel with college-wide productivity trends where productivity dropped from 550 in 2020-21 to 485 in 2021-22 and slowly recovered over the next two years to 517 in 2023-24. We do make efforts to maintain high productivity in our course offerings, but we also observe that a focus on productivity comes at a cost to our students, especially those from underrepresented populations and most in need of our support.

Action: What actions does your program plan to take in order to achieve your goals?

We will continue our practice of balancing both offering double sections to maximize productivity with offering single sections when appropriate to meet student demand. However, we feel that scheduling a 48/56/64-student lecture in double sections is detrimental to student learning. In addition, instructors are not compensated for the additional students in a double lecture as the instructional load is identical for a 24/28/32-student single lecture and a 48/56/64-student double lecture despite the significantly greater workload in teaching and evaluating students in double lectures.

Needs: What does your program need to execute this action plan?

The goal of increasing productivity by offering more double sections is contrary to the goal of increasing enrollment through offering less productive single sections. Some guidance for which goal to prioritize over the other would be helpful. Additionally, the attrition that occurs across a course series generally necessitates inclusion of single sections within the sequence despite them being counter to productivity goals. We cannot maximize productivity through only offering double sections without excluding some students despite making a commitment to offering year-long course sequences. Students should not need to advocate for themselves to meet their transfer goals.

The goals we have to best serve our students as a department come at a cost to productivity, but promise greater enrollment and most importantly, greater student success. We believe this is a worthwhile trade off. We would need the College to share this vision in order for us to execute this plan.

C. Enrollment by Student Demographics

Enrollment Distribution

Enrollment Distribution For Program Review

Student Headcounts by Gender

	2019-20		2020-21		2021-22		2022-23		2023-24	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Female	1,825	62%	2,242	66%	1,567	61%	1,303	59%	1,424	58%
Male	1,113	38%	1,118	33%	972	38%	882	40%	962	39%
Non-Binary	2	0%	1	0%	0	0%	0	0%	0	0%
Unknown gender	26	1%	39	1%	26	1%	27	1%	62	3%
Total	2,966	100%	3,400	100%	2,565	100%	2,212	100%	2,448	100%

Student Headcounts by Race/Ethnicity

	2019-20		2020-21		2021-22		2022-23		2023-24	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Asian	1,111	37%	1,254	37%	930	36%	715	32%	852	35%
Black	106	4%	135	4%	98	4%	73	3%	80	3%
Filipinx	228	8%	229	7%	173	7%	160	7%	157	6%
Latinx	757	26%	924	27%	739	29%	664	30%	716	29%
Native American	5	0%	6	0%	8	0%	3	0%	10	0%
Pacific Islander	23	1%	48	1%	25	1%	16	1%	18	1%
Unknown ethnicity	48	2%	58	2%	59	2%	62	3%	76	3%
White	688	23%	746	22%	533	21%	519	23%	539	22%
Total	2,966	100%	3,400	100%	2,565	100%	2,212	100%	2,448	100%

C.1 - Enrollment by Gender

Goals: What is your program’s goal with respect to enrollment by gender?

To support all students regardless of gender and to maintain the current student distribution by gender.

Observation & Inferences: What do you observe in the data above in relation to your goals? What do you want the college to understand about enrollment by gender in your program?

Women have typically been underrepresented in STEM programs; we are pleased to observe that we have held steady at ~60-65% women enrolled in our various courses over the past several years. We would like to highlight that the CHEM 30 program has a student population of 75-80% women compared to our other programs which have 50-55% women. This reflects the gender distribution in the biological sciences and various allied health fields. We note that the college-wide population is roughly evenly split across men and women, with a lower percentage of women compared to within our chemistry program.

Action: What actions does your program plan to take in order to achieve your goals?

We plan to continue to serve as many student populations as possible by offering alternative course scheduling options such as hybrid courses, evening courses, and Friday lab sections, particularly in our CHEM 25 and 30A courses.

Needs: What does your program need to execute this action plan?

We need to maintain or grow our section offerings to be able to provide the scheduling options listed above.

C.2 - Enrollment by Ethnicity

Goals: What is your program's goal with respect to enrollment by ethnicity?

To enroll and retain more students of color in our program including increasing our Black and Latinx populations by 2% to match the college population.

Observation & Inferences: What do you observe in the data above in relation to your goals? What do you want the college to understand about enrollment by ethnicity in your program?

The distribution of enrollment with respect to various ethnic groups has been consistent over the past five years. We have observed a 3% increase in the number of Latinx students, roughly consistent with the 5% increase in the college-wide Latinx student population over the same time frame. We also have more Asian students - 35% vs 27% collegewide - and fewer Black students - 3% vs 5% collegewide.

Action: What actions does your program plan to take in order to achieve your goals?

Partner with Umoja and Puente to discuss the possibility of offering targeted sections for these learning communities.

Needs: What does your program need to execute this action plan?

We need the administration to support offering early college-level math courses so students have the necessary math skills to succeed in our program. It is also important that we offer additional sections to support future increases in enrollment. Faculty tutors at the STEM center are also an invaluable resource for our chemistry students.

D. Overall Student Course Success

Student Population Areas of Focus

Course Success For Program Review

Limits: Course Credit Status Credit

Course Success

Science Tech Engin & Math - Chemistry-FD

	2019-20		2020-21		2021-22		2022-23		2023-24	
	Grades	Percent	Grades	Percent	Grades	Percent	Grades	Percent	Grades	Percent
Success	2,245	76%	2,597	76%	1,892	74%	1,736	78%	1,942	79%
Non Success	345	12%	367	11%	316	12%	235	11%	235	10%
Withdrew	376	13%	436	13%	357	14%	241	11%	271	11%
Total	2,966	100%	3,400	100%	2,565	100%	2,212	100%	2,448	100%

Course Success for Black, Latinx, and Filipinx Students

	2019-20		2020-21		2021-22		2022-23		2023-24	
Success	722	66%	855	66%	651	64%	636	71%	620	71%
Non Success	182	17%	217	17%	198	20%	143	16%	135	15%
Withdrew	187	17%	216	17%	161	16%	118	13%	118	14%
Total	1,091	100%	1,288	100%	1,010	100%	897	100%	873	100%

Course Success for Asian, Native American, Pacific Islander, White, and Decline to State Students

	2019-20		2020-21		2021-22		2022-23		2023-24	
Success	1,523	81%	1,742	82%	1,241	80%	1,100	84%	1,322	84%
Non Success	163	9%	150	7%	118	8%	92	7%	100	6%
Withdrew	189	10%	220	10%	196	13%	123	9%	153	10%
Total	1,875	100%	2,112	100%	1,555	100%	1,315	100%	1,575	100%

Some courses may continue to be listed but no longer have data due to renumbering or because the course was not offered in the past five years.

D.1 - Student Course Success

Goals: What is your program’s goal with respect to student course success?

To maintain or increase the student success rate for our courses.

Observation & Inferences: What do you observe in the data in relation to your goals? What do you want the college to understand about the student course success in your program?

Our program student success rate has remained relatively consistent over the past five years - 74% to 79% - which is in line with STEM division-wide student success rates. However, this is somewhat lower than the collegewide student success rate (81% to 83%) - this seems to be mainly because 4-6% more students withdrew from chemistry courses compared to courses collegewide. The student success rate for chemistry has increased over the last two years though, and the withdrawal rate has also decreased within the same time frame.

Action: What actions does your program plan to take in order to achieve your goals?

We will continue to offer hybrid sections when feasible as students are more likely to complete those courses compared to face-to-face courses (see below). In addition, our instructors will continue to employ a variety of instructional methods to maximize student success in our courses. We will also continue to engage in conversations about RSI and develop a toolbox for teaching courses hybrid.

Needs: What does your program need to execute this action plan?

Professional development is always helpful in learning about new pedagogical practices. We also need to be able to address student demand across a series by offering more sections and not cutting students off once we’ve committed to offering the full course series.

D.2 - Course Success by Modality

Click the link below to view the program's Course Success by Modality data

https://foothilldeanza-my.sharepoint.com/:f:/g/personal/20078222_fhda_edu/Euw5yUwbvn5OiqkDTAn6yIYBycY0PmInLpXnQm47I7cPKQ?e=rSml5L

Goals: What is your program's goal with respect to course success by modality?

To maintain or increase the student success rate for our courses.

Observation & Inferences: What do you observe in the data in relation to your goals? What do you want the college to understand about course success by modality in your program?

The "online synch/asynch" is for the CHEM 81 course which is not taught by faculty in our program. The two types of hybrid courses offered in our program (synch/on-campus and asynch/on-campus) generally have higher success rates than face-to-face courses and capture 30-40% of our total chemistry student population. This higher success rate is due both to better student retention (9% withdrawal rate in 2023-24 vs 13%) and to a lower non-success rate (6% in 2023-24 vs 12%).

It is difficult to compare success rates for face-to-face vs hybrid courses in our department because the CHEM 1 and 12 series have much fewer (or no) hybrid courses compared to the CHEM 25 AND 30 series.

Action: What actions does your program plan to take in order to achieve your goals?

We will continue to offer hybrid sections when feasible as students are more likely to complete those courses compared to face-to-face courses. In addition, our instructors will continue to employ a variety of instructional methods to maximize student success in our courses in addition to engaging in conversations about RSI and developing a toolbox for teaching courses hybrid.

Needs: What does your program need to execute this action plan?

Professional development is always helpful in learning about new pedagogical practices.

E. Disproportionate Impact

Click the link below to view the program's Disproportionate Impact data

https://foothilldeanza-my.sharepoint.com/:f:/g/personal/20078222_fhda_edu/Euw5yUwbvn5OiqkDTAn6yIYBycY0PmInLpXnQm47I7cPKQ?e=rSml5L

Identify the groups that are experiencing a disproportionate impact in the most recent year (please provide the percentage point gap and the number of additional successes needed to erase the percentage point gap for each group).

Black (-10%), Latinx (-15%), women (-2%), low-income (-8%)

Goals: What is your program's goal with respect to disproportionate impact?

Reduce disproportionate impact by engaging with college support systems. Reduce the achievement gap in Black, Latinx, and low-income students by 3%.

Observation & Inferences: What do you observe in the data in relation to your goals? What do you want the college to understand about the disproportionate impact in your program?

Black and Latinx students continue to experience a disproportionate impact in success rates for chemistry courses. The achievement gap for Black students has fluctuated substantially over the past five years due to their relatively small student population (-3% to -19% with no perceptible trend). The achievement gap for Latinx students, however, has steadily decreased from -18% in 2020-21 to -17% then -14% then -14% for 2023-24.

The achievement gap for low-income students is -8% for 2023-24 which is substantially lower than that in previous years (typically -12%). This can partially be attributed to the greater availability of open educational resources for student use such as the transition to the OpenStax chemistry textbook for the CHEM 1 program that year. We are interested in exploring additional online platforms for assessing student learning.

Action: What actions does your program plan to take in order to achieve your goals?

We will continue to offer hybrid sections when feasible as students are more likely to complete those courses compared to face-to-face courses. In addition, our instructors will continue to employ a variety of instructional methods to maximize student success in our courses. We will also continue to work with MESA to support student clusters in our courses (3 or more enrolled MESA students), as well as offer AEW (Academic Excellence Workshops) for our CHEM 25 students. Finally, we will continue to explore and utilize free online resources whenever possible to minimize the costs of resources for students.

Needs: What does your program need to execute this action plan?

We plan to maintain our relationship with the SLI and MESA programs to engage with students coming from underrepresented populations.

F. Regular and Substantive Interaction

If your program has any courses that are approved for distance education, describe how regular and substantive interaction was incorporated in those courses. (List each course)

CHEM 25, 30A, 30B, 1A, 1B and 1C are all approved for distance education. Full-time faculty teaching these courses have completed RSI training and have developed student-facing and internal communication plans.

G. Summary

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

A recurring theme throughout this document has been the need to proactively offer more sections rather than leaning on historical section offerings to build quarterly schedules. In addition, it is our duty to provide a pathway for all interested students to start and to complete a course sequence required for their transfer goals, including offering terminal courses in a series. If we do not carry out these duties, we will not be able to serve our students and our retention rate will suffer.

We have improved our student success rate in various ways, most importantly in offering hybrid versions of most courses in our programs and in incorporating open-access course resources in our courses. We will continue to explore a variety of instructional methods to maximize student success in our courses, and will also continue to collaborate with dual enrollment, the SLI and the MESA programs to engage student interest.

H. Rubric

Click the link below to view the Instructional Template Rubric.

https://foothilldeanza-my.sharepoint.com/:w:/g/personal/20078222_fhda_edu/EeXQOxxcngRGsXkb-Btxsz4BoUlaCXwgPngOB_gc8HQemw?e=2EgwaV

End of Instructional Discipline Template

This form is completed and ready for acceptance.