

[Plans for Chemistry](#) >> 2025 - 2026 Chemistry CHC Instructional 2Yr. or SLO Plan 2025-2026

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Name :

2025 - 2026 Chemistry CHC Instructional 2Yr. or SLO Plan 2025-2026

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Instructions

The 2Yr. plan provides the opportunity for each program to update their four-year action plan and requires each plan to provide the current status on their course outcomes assessment, progress on effectiveness measures, and progress each program has made on achieving their goals and objectives. This is optional for SLO Plans.

Please respond to the following questions. Please consult the [Integrated Planning and Program Review Handbook](#) for detailed instructions, the [timeline](#) for due dates, and the [schedule](#) for the four-year plan schedule.

1. Mission

Updating this Question is Optional on 2Yr. and SLO Plans

a. Tell us your unit's mission: Provide a mission statement for your unit that clearly and succinctly describes your unit's purpose, idealistic motivations, and change it hopes to inspire.

b. Alignment with the college Mission: **Rubric Item (Mission Alignment)**: The Crafton Hills College mission is to change lives. We seek to inspire our students, support our colleagues, and embrace our community through a learning environment that is transformational. Crafton Hills College welcomes everyone and is committed to working with students from diverse backgrounds. The College has an exceptional learning environment built on a tradition of excellence, a talented faculty, a driven student body, a committed staff, with passionate leadership and community support. **In what ways does your program advance the mission of the college?**

CHC Chemistry Discipline Mission Statement

In the process to inspire and change our students lives, we offer all the core chemistry classes and advanced chemistry courses to progress the educational, career, and personal success of our students and courses needed for transfer to the UC and CSU systems as well as courses to complete general education.

We serve students with respect and integrity who intend to major in such diverse fields as biochemistry and biotechnology, engineering, medicine and health sciences, biology, physics, and of course chemistry through a learning environment that is transformational.

In what ways does your program advance the mission of the college?

The Chemistry Mission Statement is in complete alignment with the mission of the college which helps advance the mission and vision for both.

Within our department you will find committed and supportive chemistry faculty and staff striving to maintain a well-respected chemistry program for our diverse campus community through engagement and innovation while promoting a welcoming environment through equitable and antiracist practices in all aspects of our work. In the tradition of excellence, we provide students ample contact with the instructor in a relaxed atmosphere that only a limited class size can offer.

2. Description of Program

Updating this Question is Optional on 2Yr. and SLO Plans

- a. Organizational Structure and Staffing
- b. Describe any activities in addition to instruction that you provide.
- c. Describe any alternative modes of instruction and schedules of delivery: e.g.: online, hybrid, early morning, evening services.

d. **Rubric Item:** Describe how your curriculum is up-to-date, addresses equity and inclusion, and is demonstrably [Needs-Based](#). Base the description on surveys, labor market data, transfer patterns such as GE, IGETC, CSU, AA-T, or AS-T, accreditation standards, and/or articulation agreements. Consider the results of your most recent curriculum reviews in this section.

e. **Rubric Item:** Attach your [scheduling matrix](#) to show when courses in your area are offered. [Click here for sample!](#)

a. Organization (including staffing and structure)

The Chemistry department is supportive of our colleagues and as of 2022 -2023 is made up of three full-time tenured faculty members, Dr. Kim Salt, Dr. Shohreh Rahbarnia and Kelly Boebinger, a full-time lab technician Dave Stevenson, and between 4-6 adjunct faculty members. The full-time faculty members are responsible for overseeing the overall department and activities which include adjunct support, departmental meetings, and along with the chair - review applications and interviewing potential adjunct faculty members, institute SLO cycles and reporting, and departmental student recognition selection. The chemistry laboratory technician coordinates the chemistry labs through collaboration with their co-workers the Faculty. This department is part of the Division of Physical & Biological Sciences (Chair, Sam Truong) and is part of the College of the Arts & Sciences (Dean, Van Muse).

b. Describe any activities in addition to instruction that you provide.

We are unique from many other programs on campus in that we provide our students with the opportunity to take advanced classes such as Organic Chemistry I & II (CHEM 212 & CHEM 213). This is a course typically taught at the junior level in universities and all community colleges have an agreement with UC & CSU that those courses can be taught at the community college level. This is so that students many get a full two-year program at community colleges before transferring as a junior to 4-year institutions. Students must earn a B or higher for the course to be transferred. This is a great opportunity for our students interested in the STEM field and those with the desire to continue on in graduate and post graduate studies in the field of medicine, dentistry, and pharmacy.

Our full time (FT) faculty are very active on the CHC Committees they have signed up on. Dr. Kim Salt has been the Chair of Curriculum for over 19 years and currently she is serving as co-chair. Dr. Shohreh Rahbarnia is an active member of the Curriculum committee. Kelly Boebinger is an active member of ETC (Educational Technology Committee). Each FT faculty member participates each semester in manning the Welcome Centers, we have been known to also participate judging the A&P annual Halloween costume contest and

assist in Graduation breakfast and other activities. Our FT lab technician Dave Stevenson is also involved in many Campus and District Wide committees. He regularly participates on hiring committees including Classified, Faculty, Management and even the Chancellor's. Until recently he even chaired a District wide Committee.

All FT faculty participates in course scheduling, and we all work closely with our department chair. Our FT faculty also takes care of textbook ordering for all chemistry sections including those taught by adjunct faculty. All FT faculty have participated in hiring committees ranging from management, classified personnel, FT faculty and part-time (PT) faculty.

Our FT faculty mentors our PT faculty especially when newly hired. Dr. Rahbarnia also has directed PT faculty meetings on in-service days to help our instructors be more informed and also to provide continuity between multiple sections of the same course.

c. Describe any alternative modes of instruction and schedules of delivery: e.g.: online, hybrid, early morning, evening services.

Chemistry offers a variety of courses offered at a variety of times. Multiple sections of Chemistry are offered for many courses each semester, and courses start as early as 7:00 am, others end at 9:50 pm.

We offer a fully online chemistry course CHEM 123: Chemistry for Everyone, this class tends to fill quickly, and we recently increased to offer 3 sections per semester and usually 2 sections each summer. We offer late-start CHEM 123 sections.

For CHEM 102: Introduction to Organic Chemistry, in addition to the face-to-face course, we offer Hybrid course usually one section each semester, this is where students do the lecture portion of the course online and come on campus weekly for experiments and exams.

For General Chemistry (CHEM 150 & 151), we offer each course each semester allowing students the flexibility to start the sequence in either fall or spring.

We offer the advanced chemistry courses, CHEM 212/213 General Organic Chemistry I & II, once a year, when enrollment increases, we look forward to offering these courses off sequence in addition to the traditional offering.

d. Rubric Item: Describe how your curriculum is up-to-date and Needs-Based. Base the description on surveys, labor market data, transfer patterns such as GE, IGETC, CSU, AA-T, or AS-T, accreditation standards, and/or articulation agreements. Consider the results of your most recent curriculum reviews in this section.

Chemistry offers courses for chemistry majors, non-majors, students seeking an associate degree (AST or AS) in chemistry, students wishing to transfer to allied health programs or continue to a four-year university.

We offer advanced chemistry courses (CHEM 212 & 213) that help support our STEM students to transfer as juniors to 4-year universities.

All course outlines are up to date, align with C-ID Descriptors, SBCCD Board approved, and demonstrate the needs of our campus while addressing equity and inclusion.

All chemistry courses are articulated to transfer to CSU and UC campuses, as well as many private and out-of-state institutions.

Needs Based Curriculum:

Credit Programs:

- [Associate in Science in Chemistry for Transfer \(AS-T\) Degree](#)
- [Chemistry - Associate of Science Degree](#)

California State University (CSU) General Education Requirements 2022-2023

B. SCIENTIFIC INQUIRY AND QUANTITATIVE REASONING

9 semester units or 12 quarter units required. Choose at least one course from each area. At least one of the science courses must have a laboratory. Laboratory courses are underlined.

1. Physical Science: CHEM 123, 101, 102, 150, 151, 212, 213

Intersegmental General Education Transfer Curriculum (IGETC) for Transfer to CSU and UC 2022-2023

Area 5 – Physical and Biological Sciences: A: Physical: CHEM101, 102, 123, 150, 151, 212, 213

e. Rubric Item: Attach your scheduling matrix to show when courses in your area are offered.

See attachments

3. External Factors with Significant Impact

Updating this Question is Optional on 2Yr. and SLO Plans

What external factors have a significant impact on your program? Please include the following as appropriate:

- a. Budgetary constraints or opportunities
- b. Competition from other institutions
- c. Requirements of four-year institutions
- d. Requirements imposed by regulations, policies, standards, and other mandates
- e. Job market
 - i) Requirements of prospective employers
 - ii) Developments in the field (both current and future)

a. Budgetary constraints or opportunities

Our current annual budget is \$6,000. This is not enough to support our STEM students for the number of lab sections we offer, and constraints are the daily operational costs of reagents and lab supplies, along with increased costs are increased shipping fees and hazard fees. Replacement costs of items such as broken glassware and contaminated reagents at times becomes an additional constraint.

The state has mandated a change to the number of units for the advanced Chemistry courses CHEM 212 & 213. They will be changing from a 4-unit course with one 3-hour laboratory session per week to a 5-unit course with 6-hours of laboratory per week with double the experiments and budgetary needs. These advanced courses are required for all our STEM students who desire to continue their education and transfer to a 4-year university as a junior.

In looking at our scheduling matrix for chemistry lab courses, annually we usually offer 22 sections of CHEM 101 (1 lab per week), 4 sections CHEM 102 (1 lab per week), 8 sections of CHEM 150 and 151 (2 labs per week for each course) & 2 sections of CHEM 212 and 213 (2 labs per week). With the budget at \$6,000, then there is only \$130 for each section, not per lab, per section for all students in the entire section, for all experiments for the entire semester. There are approximately 900 students enrolled in all those sections according to course caps. With a budget of \$6000 that is \$6.67 per student per section.

We request that the annual chemistry budget be increased to at least \$10,000 annually.

A Snapshot History of the Chemistry Annual Budget:

- 1999-2000: \$ 4,430 (2 FT faculty, fewer sections offered and NO OCHEM offered)

- 2005-2018: \$ 3,500 (3 FT faculty, more sections and 6 sections of OCHEM offered)
- 2018-2019: \$ 5,000
- 2019-2020: \$ 20,000
- 2021-present: \$ 6,000

Note: Since the 2007 Chemistry Annual plans and Program Reviews, we have been requesting that our budget be increased to \$10,000. We understand that the CHEM budget for SBVC is over \$30,000 annually.

b. Competition from other institutions

All colleges offer the same courses that we offer at CHC, the high demand for these courses ensures our continued enrollment. We do offer a hybrid CHEM 102 course and a 100% online chemistry course (CHEM 123) for non-majors. For Fall 2022 we offered multiple sections of Remote CHEM 101. We have seen enrollment in our online and remote sections fill before our in-person classes.

c. Requirements of four-year institutions

Chemistry majors are able to complete the two-year program of General Chemistry (CHEM 150 & 151) and Organic Chemistry (CHEM 212 & CHEM 213) in two years. All chemistry courses are transferable to CSU and UC and articulation agreements are in place for many private colleges.

Many 4-year institutions are not accepting as a transfer lab course that were not held in-person. There may have been exceptions for the Covid Remote classes but that exception does not appear to be extended.

d. Requirements imposed by regulations, policies, standards, and other mandates

All chemistry personnel participate in the mandated annual safety programs and training. All adhere to the regulations, policies and standards set by the district and any OSHA mandates.

e. Job market

Most students taking chemistry courses plan on transferring to Allied Health Programs or to four-year institutions to compete degrees and many move on the graduate studies to become Nurses, Dental Hygienists, Nutritionists, Pharmacists, Veterinarians, and Medical Doctors.

i) Requirements of prospective employers

CHC offers an associate degree in chemistry for those employers requiring that degree. Most job opportunities for our students require additional training or education, so most students transfer to an allied health program or university.

ii) Developments in the field (both current and future)

The basics of chemistry are what is required for our department to cover, and when any new developments come up, instructors commonly include them in the curriculum.

4. Progress on Outcomes Assessment (Two-Year Question)

Updating this Question is Required on 2Yr. Plans and Optional on SLO Plans

Refer to the [SLO Cloud](#) and the [SLO Cloud Dashboard](#) to evaluate the results from your course level Student Learning Outcomes (SLOs) and to develop actions reflected in your program review action plan (i.e. Question 10).

- a. Please summarize course **SLO assessment results**. Include a discussion of whether or not disproportionate impact has been identified and whether the program met its target for each course SLO.
- b. Please describe any course and/or instructional improvements you plan to make as a result of the course SLO assessment(s), specifically focusing on removing any identified disproportionate impact.
- c. What objective(s) or action step(s) will you add to Question 10 as a result of the SLO assessment(s)? If none, please explain.

a. Please summarize Program Level Outcomes (PLO) assessment results. Include a discussion of whether or not the program met its target for each PLO.

We have designed an Outcomes Mapping document for each chemistry course indicating the PLO, GEO, ILO and Course SLO assessed. This document has been included in this report as an attachment

For each course offered at CHC, (CHEM 101, 102, 123, 150, 151, 212, & 213) we have designed a SLO Data sheet template we used to easily gather the data required to assess the course for PLO, GEO, ILO & SLO. The SLO Data sheet templates are included in this report as an attachment.

The following is an analysis of the combined summary report for the last 3 years was generated for years 2021-2022, 2020-2021, 2019-2020 with 62 sections reporting and a total of 1,537 students assessed.

- PLO #1: Identify the basic areas of Chemistry that are appropriate to each Chemistry course. This content will allow students to continue in successive Chemistry courses, as well as relate the knowledge for matriculation and lifelong learning.

Percent students meeting rubric 3 or higher: 84.52%. Evaluation of the percent of students that score 3 or higher and considering the number of students assessed, it is the opinion of the program that the target has been met.

- PLO #2: Comprehend and use laboratory skills in synthetic, quantitative, and instrumental methods as scientific approaches to gathering and verifying knowledge.

Percent students meeting rubric 3 or higher: 80.02%. Evaluation of the percent of students that score 3 or higher and considering the number of students assessed, it is the opinion of the program that the target has been met.

- PLO #3: Demonstrate critical thinking in Chemistry including interpretation, evaluation, explanation, and critical inquiry; how to ask appropriate questions, gather relevant information efficiently and creatively, sort through this information, reason logically from this information and come to reliable and trustworthy conclusions.

Percent students meeting rubric 3 or higher: 81.43%. Evaluation of the percent of students that score 3 or higher and considering the number of students assessed, it is the opinion of the program that the target has been met.

- PLO #4: Collect, analyze and articulate results clearly and effectively in speech and in writing in an acceptable style of presentation.

Percent students meeting rubric 3 or higher: 82.85%. Evaluation of the percent of students that score 3 or higher and considering the number of students assessed, it is the opinion of the program that the target has been met.

b. Please describe any program/course and/or instructional improvements you plan to make as a result of the PLO assessment(s).

The following are a few of reflection statements from instructors, both full-time and part-time, from various courses. Many of these can be used across the board for all the chemistry courses.

- Continue to encourage students throughout the term and remind them of ways to study and to improve on assignments and exams.
 - Continue to encourage students and help with study techniques.
 - Reach out to under-performing students to identify their current needs.
 - Encourage or remind students to attend office hours. Encourage and practice the skill of critical thinking, via group activities, individual practice, homework, problem sessions.
 - Many students did not complete Mastering Chemistry assignments. Will remind weekly of upcoming due dates and emphasize importance for course grade. Continue to monitor student progress and make modification where necessary.
 - Continue to evaluate how students are doing through the course term to see if modifications are required.
 - Explain the importance of homework assignments in students' learning process.
 - Students need more math knowledge and understanding before being able to solve problems. Tutoring and STEM center will be a big part of improving this need, as well as workshops and refresher videos.
 - Homework during the semester will need to have a higher weight towards the overall score, the lack of doing homework affected greatly students, it corresponded with low exam scores.
 - Stronger math skills, teach note taking and effective studying, push tutoring center more, teach how to be a student and time management.
- **c. What objective(s) or action step(s) will you add to Question 10 as a result of the PLO assessment(s)? If none, please explain.**
- To enhance learning, comprehension, and critical thinking skills for students, lab reports and assignments can be revised and rewritten based on evaluation and feedback of students work from pervious terms. To help students and for them to get more practice, design and development of new worksheets, revisions of other worksheets and additional practice problems.
 - Encourage students to use CHC Student Services such as the STEM Center & Tutoring.

5. Unit's Performance on Institutional Quantitative Effectiveness Indicators

Updating this Question is Optional on 2Yr. and SLO Plans

Please discuss your program's performance on each data item below.

a. Instructional Program Health Evaluation Rubric

i) **Rubric Item:** Use Office of Institutional Effectiveness, Research, and Planning (OIERP) data to set a [Course Completion Rate](#) target, provide an explanation for the target that has been set, develop strategies to reduce disproportionate impact if any exists by gender, age, or ethnicity, and include any strategies in the action plan (i.e. Q10). **Please visit the [Completion & Success Dashboard](#) to access your program specific data.**

ii) **Rubric Item:** Use OIERP data to set a [Course Success Rate](#) target, provide an explanation for the target that has been set, develop strategies to reduce disproportionate impact if any exists by gender, age, or ethnicity, and include any strategies in the action plan (i.e. Q10). **Please visit the [Completion & Success Dashboard](#) to access your program specific data.**

iii) **Rubric Item:** What is your [FT/PT Faculty Ratio](#), how is it impacting your program, and student success? **Please visit the [Full-Time/Part-Time Faculty Ratio Dashboard](#) to access your program specific data.**

iv) **Rubric Item:** Use OIERP data to set a [WSCH/FTEF](#) Ratio target and provide an explanation for the target that has been set. Based on Faculty dialogue what is a feasible WSCH/FTEF (productivity) target for your area? (Note: 525 may not be a realistic target for your area.) **Please visit the [WSCH/FTEF Dashboard](#) to access your program specific data.**

a. Instructional Program Health Evaluation Rubric

i) Rubric Item: Use Office of Institutional Effectiveness, Research, and Planning (OIERP) data to set a Course Completion Rate target and provide an explanation for the target that has been set.

- For all our chemistry courses we have set the target completion rate to be 80%. We have a variety of courses that require a prerequisite, some math, and others chemistry courses, and only one course that doesn't have a prerequisite. We feel that courses with a prerequisite should ensure a higher completion rate for all chemistry students. We also keep in mind that due to just the nature of the subject material that our completion rate would be negatively effected therefore we came up with a balanced value of 80%.

- Over the last 5 years the completion rate for all chemistry courses were an average of 87.58%. See attachments for the original OIERP data. We have met our program target in all courses.

ii) Rubric Item: Use OIERP data to set a Course Success Rate target and provide an explanation for the target that has been set.

- The most notable improvement is our success rate is CHEM 150.
 - In 2017-18 the success rate for CHEM 150 did not meet our program target with a low of 55.7%.
 - During 2017-18 the CHEM 150 curriculum was rewritten, and board approved to include CHEM 101 as a course prerequisite.
 - In fall 2018 our department first implemented the prerequisite because we wanted to help our student's success. At the time the state did not require this and now the state has added a mandatory chemistry prerequisite for General Chemistry, we were ahead of our time!
 - This change has made an impact on the success of our students in CHEM 150 were the 4-year average (2018-2021) success rate is 73.2%.
 - Not only does the data show this was the correct change and helpful to students, but the C also-ID descriptors are now having a chemistry prerequisite for General Chemistry now.
- For all our chemistry courses we have set the target Success rate to be 60%. Our courses are taken by those students wishing to have a career in Allied Health. For many this is the first science course they have taken, and chemistry seems to be a course that students make career changes when they see that they may not be cut-out for the rigor of a degree in the sciences. We also keep in mind that due to just the nature of the subject material that our completion rate would be negativity effected therefore we came up with a balanced value of 60%.
- Over the last 5 years the Success Rate for all chemistry courses were an average of 70.88%. CHEM 151 has a 5-year average success rate of 83.06% (up from PR 2018/19 at 79.32%). CHEM 123 a fully online course with no prerequisite had a 5-year average success rate of 87.68% We have met our division target in all courses.

iii) Rubric Item: What is your FT/PT Faculty Ratio, how is it impacting your program, and student success?

- The FT/PT target is 75% or higher. According to OIERP data, chemistry over the past 5 years, the FT/PT ratio has averaged 52.4%. For 2021-2022 the ratio for chemistry hit a low of 46.0%.
- We expect the district to approve Lecture/Lab parity in the near future. This will impact our Full-time instructors load and assignments and increase the need for more PT instructors.
- The impact on our program is that it is often difficult to find not just qualified instructors, but also those with a passion for teaching. Most scientists that earn a Master's degree or higher in chemistry do not want to teach at a community college nor opt to be paid the salary of a teacher when in industry there are much higher paying careers.
- As to how this impacts the success of our students: Last minute replacements are not always the best nor well-prepared instructors. Many times, over the years we have had well qualified and excellent part-time instructors working for us for a few semesters then they get a full-time job, and we must fill their assignment with last minute replacements.
- We have been fortunate that in the hiring process of our part-time (PT) faculty, Dr. Rahbarnia has taken in under her wing to review the applicants and assist our department chair Dr. Truong in the interview process to help get better qualified instructors.
- Fall 2022: As an example, we lost 3 excellent part-time faculty that were scheduled to teach fall 2022 when they got full time jobs at other colleges, and we were informed a just few weeks before the start of the term and in one case just days. We had to have last minute interviews and schedule changes. We had to rearrange assignments and loads for other faculty, cancel two sections, and move several of our CHEM 101 to remote modality since the instructors found did not live in the area. As a department, we know that students that get to have hands-on lab experiences are better off than those that only use virtual experiments.
- From reviewing this data, Chemistry is adding the need for a full-time instructor to be filed as soon as possible.

iv) Rubric Item: Use OIERP data to set a WSCH/FTEF Ratio target and provide an explanation for the target that has been set. Based on Faculty dialogue what is a feasible WSCH/FTEF (productivity) target for your area? (Note: 525 may not be a realistic target for your area.)

- While looking at the data for WSCH/FTEF Ratio, keep in mind that chemistry has a lab associated with all our courses (except CHEM 123). In 2021-22 chemistry offered 42 three-hour lectures and 46 three-hour labs. Each three-hours of lecture students earn three units, while for each three-hours of lab they earn just one unit. As to load for FT instructors, each three-hour lecture is 0.2 load, while each three-hour lab is 0.147 load. This will have an impact on the WSCH/FTEF Ratio. Based on dialog between chemistry faculty we set the target for chemistry WSCH/FTEF Ratio above the campus average.
- According to the data provided by OIERP for the last 5 years the campus average WSCH/FTEF ratio was 423 while during the same time chemistry had an average ratio of 497. We have met our target and have exceeded the campus average. We had a high of 525 in 2018-19 before remote instruction was introduced and we did however see a huge decline in 2020-21 to 483 and in 2021-22 to a low of 462.

v) Rubric Item: The Fill rate target is 80% or higher. Use the data provided by the OIERP and please provide a reason for any deviation from the target. This may involve a discussion around the appropriateness of the cap and how it was set.

- Consistently about 94.92% over the last 5 years with a high of 98.6% for 2018-19. We have exceeded the target fill rate of over 80%.
- While still exceeding the target of 80%, we do see a drop in our fill rate during the time of Remote instruction to a low of 88.2% in 2021-22 while the campus saw a low of 60.7%.
- Chemistry courses are in a high demand, and we have a good reputation for having a quality program. Our courses fill early in the registration period. In many of our courses and sections, we have recently had to turn several students away that wanted to add the class on the first day of class. The number of students turned away would be enough students to fill a new section. We would need an increase in our annual budget to open more sections since our course have laboratories with them that use consumable resources.

- Our courses have appropriate caps, and many of our courses have caps that are set due to contractual agreements and also for lab space and safety, changing the caps would have no effect on our fill rate.

6. Other Unit-Specific Quantitative and Qualitative Results

Updating this Question is Optional on 2Yr. and SLO Plans

- a. **Rubric Item:** How do your [program student demographics](#) relate to the college demographics? What are the discrepancies, and what plan do you have to address any discrepancies? Include any plan to address discrepancies in the action plan (Q10) – **please visit the [Demographics Dashboard](#) to view program and college demographics by year.**
- b. Summarize the results of any quantitative or qualitative measures not provided in the previous question that you have chosen to gauge your program’s effectiveness (e.g.: transfers, degrees, certificates, satisfaction, enrollments, Perkin’s data, equity data, student research experience, student clubs, etc.). **Please visit the [Degrees & Certificates Dashboard](#) to access your program specific data on degrees and certificates.**
- c. What improvements/changes have you implemented or do you plan to implement as a result of your analysis of the measures illustrated in 6a and 6b? Include any plans in the action plan (Q10).

a. Rubric Item: How do your program student demographics relate to the college demographics? What are the discrepancies?

Representativeness of population served: Based on data provided from CHC OIERP we see that the chemistry discipline serves the population like the campus with a few minor differences. In gender, chemistry serves fewer male students than the campus, most likely due to more females entering the nursing and dental hygiene field, two of the main types of students taking our chemistry courses. Chemistry tends to have a slightly higher average than the campus for average age of students, we do serve several return students in our discipline.

b. Summarize the results of any quantitative or qualitative measures not provided in the previous question that you have chosen to gauge your program’s effectiveness (e.g.: transfers, degrees, certificates, satisfaction, enrollments, Perkin’s data, equity data, student research experience, student clubs, etc.)

- In the five-year period from 2017/18 – 2021/22 forty-six Chemistry AS Degrees were awarded from CHC.

- The average years for the years 2017/18 – 2020/21 was 7 degrees each year with an exceptional year 2021/22 of eighteen degrees awarded.
- We did note that the number of AST awarded in 2021/22 was 12 and AS was 6. Prior to that only 5 AST were awarded in 2019 & 2021.
- We did discuss this within our department, and we are not sure why the number of degrees increased so much that year, one suggestion is that in 2021/22 we were one of the few colleges in the area offering fully remote lecture and lab courses and we did see several students from outside our normal service area attending the remote classes. We are interested to see if that number of degrees or more are awarded in the future.

c. What improvements/changes have you implemented or do you plan to implement as a result of your analysis of the measures illustrated in 6a and 6b?

The improvements we can make to our program is to continue to be welcoming to all types of students regardless of their background. We can also help encourage students to earn a degree in chemistry here at CHC.

7. Evaluation

Updating this Question is Optional on 2Yr. and SLO Plans

Evaluation: You have already provided a description and analysis of the program in questions 1-6, please provide an analysis of what is going well/not well and why, in the following areas:

- Alternative modes and schedules of delivery (e.g.: online, hybrid, early morning, evening services, etc.)
- Partnerships (internal and external)
- Innovation and Implementation of best practices
- Efficiency in resource use
- Staffing
- Participation in shared governance (e.g., do unit members feel they participate effectively in planning and decision-making?)
- Professional development and training
- Compliance with applicable mandates

Equity – Inclusion – Diversity

Equity: Making a course affordable to all students:

- For many years, chemistry has helped students afford the course by writing our own lab experiments and saving students hundreds by not requiring them to buy a required lab experiment textbook from the bookstore or a publisher. All lab experiments for CHEM 101, CHEM 102, CHEM 150, CHEM 151, CHEM 212 & CHEM 213 are free and available to students to download and print themselves.
- Providing low-cost options for textbooks: Many courses use open-source options for the course textbooks or allow students to obtain an older version of a textbook online at a much-reduced cost. We have found many students prefer the hard copy option to the online eText option.
- Zero Textbook Cost (ZTC) Courses; Fall 2022 was the implementation of four chemistry courses becoming ZTC, these are CHEM 102, CHEM 123, CHEM 212, CHEM 213.

Inclusion & Diversity:

- All instructors and staff strive to be considerate of our students in terms of Inclusion and Diversity in all our courses. We are respectful of students chosen pronouns and strive to be inclusive when presenting chemistry topics.
- The 2022 redesign of CHEM 123 was intentional with establishing Equity – Inclusion & Diversity for our students. As stated previously, the course is now ZTC saving each student over \$120.
 - Kelly Boebinger wrote a “textbook” or Topic Reading for the course which is posted in the course through Canvas- students may read it directly online or download and print.
 - For all selected pictures and videos, care was taken to address diversity and inclusion with diverse people in photos and as hosts of videos. Selections were made from the point of view wanting students to be able to say “**Hey, they’re like me!**”.
 - A section of the course called “Chemist Highlights” allows the introduction of a very diverse and inclusive list of chemists that have made a difference. Their backgrounds, genders, cultures, and obstacles overcame are varied. The focus is not only on chemistry but also the impact on our community. An interesting highlight is that Madam Marie Curie, well know already to many,

was a single mom of two daughters. Her husband Perrie died not long after their second daughter was born, and she was able to be extremely successful as a single mom in her career.

Alternative Modes & Schedules of Delivery: Chemistry offers courses at various times of day, early morning classes as well as late morning, afternoon, late afternoon, and evening. Chemistry also offers for our students a 100% online course (CHEM 123) with some late start sections for non-majors and a hybrid CHEM 102 course. We have continued to offer a few sections of CHEM 101 as a remote class due to enrollment and faculty scheduling issues.

Partnerships: The chemistry department partnered with the Guided Pathways team and assisted in establishing a 2-year and 3-year pathway for our chemistry students. We highly recommend for students unable to take courses during the summer to follow the 3-year pathway as the better option since with the 2-year students will need to take a course during summer to complete in two years.

Innovation & Implementation of Best Practices:

Innovation: Reactions on Windows- This started a few years back for our OCHEM students in CHEM 102, CHEM 212 & CHEM 213. There are a lot of fume hoods and windows in CYN 104, and I started a class activity using all the windows. I have each student bring in a list of the reactions for the next exam as a review and summary. They each then get a whiteboard maker and write half of the reaction on a window, it could be the reactant half, or some write only the product half. The missing parts of the reactions are then filled in by a different student who did not write the specific reaction, this is done in a different color ink so we can all see the two parts, the questions and answer. Then we go around to each reaction, and I have a student explain the reaction, we discuss the reactions and look for omissions and errors and as a group we fix them. This has evolved into other topics on windows such as nomenclature and writing of structures too.

Best Practices:

- Implemented CHEM 101 as a prerequisite to CHEM 150 and saw a substantial improvement in student success. According to the data, in 2017/18 the CHEM 150 completion rate was 85.0% and a success rate 58.5%. After the implementation of the CHEM 101 prerequisite data shows for 2019/20 & 2020/21 and average completion rate of 88.85 and a success rate of 73.2%, that is nearly a 15% increase in the success rate for our students.
- We do see a negative issue with our student in regards of their preparedness for the course in terms of math. Since the implementation of students self-placing in math,

we have seen students struggle with applying math skills to chemistry concepts. The situations did occur prior to this in any a few students, we seem to see this in more students now.

- CHEM 213 students and CHEM 151 students participate in a research project. CHEM 213 students present their results in a poster session at the end of the term.

Chemistry utilizes the following best practices on a regular basis:

- **A Clear and Common Focus:** We want our students to be successful in any chemistry course they enroll in. We look for consistency in what is taught to students in all sections of CHEM 101. We have a focus on the material taught in General Chemistry and tie that information to those continuing on to Organic chemistry. Part of our common focus was to ensure that at the beginning of the semester for each chemistry lab course each instructor completes a lab safety assessment and at the end of the term a laboratory final assessment is used in all courses.
- **High Standards and Expectations:** We set our standards high and see that our students are reaching those goals.
- **Supportive, Personalized, and Relevant Learning:** We make chemistry come alive and have real word examples to help students better understand the material presented.
- **Monitoring, Accountability, and Assessment:** Along with the traditional assessments of exams we also have many other forms of assessment including prelab materials for labs, and quizzes in many courses. Online homework has been introduced in some sections that include immediate feedback to students.
- **Curriculum and Instruction:** We teach to the SBCCD Board approved curriculum.
- **Professional Development:** All chemistry personnel undergo professional development on a regular basis.
- We have been measuring and assessing our students learning for nearly fifteen years. This is not a process that we do just once or twice a year, it is a dynamic process that goes on in a continual basis with our faculty. Discussion between faculty involving best practices for our students' success is happening through the year. In the past we have collected data and assessed the data for all courses taught, and we also assess the students learning in each class and adjust our instruction to best fit the particular needs of the students in each of our courses. We

now currently concentrate on fewer courses to be assessed each year for a more efficient process.

Efficiency in resource use:

- What is working: We strive to not let budget limitations effect our student's lab experience. See question 3 for more details on the Chemistry Budget.
- What is not working: It is difficult to revise or write new experiments without funds for chemicals or materials.

We request that the annual chemistry budget be increased to at least \$10,000 annually.

Shared Governance:

- Participation in campus committees: Co-Chair of Curriculum, member of curriculum committee, member of Educational Technology Committee (ETC), Emergency Remote Instruction, Campus Safety, Crafton Council, Professional Development, (District) Facilities and Safety Advisory Committee.
- Participation in department meetings. Schedule classes and collaborate with Chair to finalize schedules.
- Review applications for PT instruction and conduct interviews and participate in hiring.
- Meet with new hires and help them assimilate to our department and campus.
- For this Program Review and also previous Annual Plans and Program reviews, all chemistry faculty, full-time & part time, and support personnel such as the chemistry laboratory technician, have had an opportunity to participate in the process. Many have chosen to give input to the document such as responses to the questions in this section.

Staffing: What is working: The chemistry discipline currently has three full-time faculty, one full-time laboratory technician, between 4 - 6 part time faculty each semester. We need a full-time instructor and an evening laboratory technician.

- **What is not working: Need full-time chemistry faculty:** Staffing has been an issue the last several semesters. We have been trying to increase our sections, but we are greatly limited by the number of adjunct faculty available in the area. This has been an issue for years. See question5 for details.

- **What is not working: Need part-time afternoon/evening laboratory technician:** Hire part-time afternoon/evening laboratory technician to obtain equity in all our sections offered. The history of this request: We have been requesting this for over 15 years in all our Program Reviews and Annual plans. At one point about 10 years ago it was approved and supposed to be funded but fell through. This is an important enough issue that we will be requesting this until it is funded.
- Lab technicians provide direct assistance with both students and faculty during labs.
- Our full-time lab tech works from 7:30am - 3:30 pm. We do not have any lab support for our afternoon/evening instructors. All daytime sections have lab support for both instructors and students, we are requesting equity in the afternoon & evening sections.
- We commonly have only one lab section each evening, so the instructor is taken away from instructing if they must go into the stockroom for materials or supplies.
- The chemistry lab rooms are very isolated from the rest of the campus, and when there is only one instructor, then they are on their own.
- If the instructor must leave to the restroom during the 3-hour lab, there is no one that can supervise the students. The lab room is usually equipped with the reagents and equipment needed, however, there are times when ice is required for the experiment or that reagents get used and must be replenished.
- This will help in lab efficiency and laboratory safety. Our evening students and instructors need support staff, this allows the instructor to devote their time to students and instruction and increases safety in the lab room.

Professional Development Training: All full-time instructors regularly participate and fulfill all professional development and training. This is going well, and new ideas are often discussed, and some implemented in our courses. All full-time faculty members exceed the minimum required time for professional development each year.

Compliance with applicable mandates:

- All courses have had curriculum updates to match C-ID Descriptors. All full-time faculty have participated in this process.
- All chemistry faculty and the Lab Tech have participated in annual safety training such as Chemical Hygiene, Safety, SDS best practices, and the new GSA labeling

system. Safety is a primary concern, and all safety measures are compiled with in each laboratory and the stockroom.

Going Well:

1. We have been very efficient with our insufficient budget and have been able to accommodate more students without compromising our standards in laboratory.
2. The use of higher technological devices such as the Vernier data collection system and the DigiMelt Melting Point Apparatus equipment has made experiments state of the art for students and much more efficient.
3. Having CHEM 101 as a prerequisite for 150 has been implemented. We want to see our CHEM 150 students become more successful.
4. STEM success stories. We have had a least 2 former CHC Chemistry students complete their degrees and return to CHC as a full-time instructor in Math, Brandi Bailes, and another as an adjunct in Anatomy & Physiology, Austin Turner, even though he has another FT job.

Reflections on Remote Instruction March 2020– Spring 2022:

What Went Right?

- All courses underwent a redesign of lab experiments for online (remote) modality.
 - This gave instructors the opportunity to emphasize and enhance laboratory theory, techniques, data analysis, and report writing.
 - Use of online resources to help demonstrate or explain the theory and technique in detail such as websites, links, and videos.
 - Some experiments videoed by instructors and students watched the lab procedure to obtain data, then write lab reports.
- Use of synchronous labs sessions via Zoom. Most instructors required cameras on during lab time to ensure the student as the one participating in the experiment.
- Use of Beyond Labz Laboratory simulator program for CHEM 101, 150, 151, 213.
 - Students still had the opportunity to choose actions as the experiments were hands on and students had to manipulate the experiment to obtain data and results.

- Simulations followed standard safety procedures. Simulation also had built in responses to bad decisions in technique and the experiment could “safely” explode.

What went Wrong?

- The lab simulator Labster did not meet our standards. Each instructor took on the experiments designed for various courses and go through numerous lab simulations and the only lab simulation worth using is the Lab Safety simulation.
- No hands on in -person lab experience for our students.
- We found more students cheating while remote in both lectures and labs.

Changes made to make it better:

- All instructors took a closer look at how to maintain our student’s chemistry experience for lecture and lab knowing that they will still need to obtain certain skills to help them become successful in their education goals. The changes were dynamic and frequent through the months of remote.
- The department reviewed many labs simulator programs and APPs to determine the best experience for our students.
- Some instructors cut down the number of exams, when we saw an increase in students cheating, and put more emphasis in scores for work completed by individuals under less time constraint like an exam such as expanded lab report requirements & questions, newly designed and developed worksheets & Supplemental Activities and written reports and presentations.

8. Vision

Updating this Question is Optional on 2Yr. and SLO Plans

a. Tell us your unit's vision: Where would you like your program to be four years from now? Dream big while considering any upcoming changes (e.g.: new buildings, labs, growth, changes in the discipline etc.).

b. Alignment with the college Vision: **Rubric Item** ([Vision Alignment](#)): The Vision of Crafton Hills College is to empower the people who study here, the people who work here, and the people who live in our community through education, engagement, and innovation. **In what ways does your program advance and align with the vision of the college?**

a. Tell us your unit's vision: Where would you like your program to be four years from now? Dream big while considering any upcoming changes (e.g.: new buildings, labs, growth, changes in the discipline etc.).

Four years from now, we would like to:

- Maintain an outstanding undergraduate experience for both chemistry majors and students in courses for non-majors.
- Expand our course offerings by adding more sections of Organic Chemistry and General Chemistry.
- Develop new laboratory experiments in all courses that engage students to think critically.
- Provide mentoring and support for adjunct faculty who will become leaders of their field.
- Develop and maintain a vital, supportive, and collegial work/study environment.
- Have a budget of \$10,000 and then increase to \$13,000.
- Have already hired a fulltime chemistry instructor.
- Have already hired a PT afternoon/evening lab technician.

b. Alignment with the college Vision: Rubric Item (Vision Alignment): The Vision of Crafton Hills College is to be the college of choice for students who seek deep learning, personal growth, a supportive community, and a beautiful collegiate setting. In what ways does your program advance and align with the vision of the college?

As a Chemistry Department:

- We value the development of knowledgeable and inquisitive students in the chemical professions.
- We value access to a quality education in chemistry for a diverse range of students.
- We value rigorous standards for teaching and learning.
- We value effective and innovative teaching practices.
- We value a collaborative, collegial, and cooperative teaching and learning community composed of diverse scholars.

- We value a supportive, safe, and healthy working environment for students, faculty, and staff.

9. Progress on Prior Goals

Updating this Question is Optional on 2Yr. and SLO Plans

Briefly summarize the progress your unit has made in meeting the goals and objectives identified in your last Four-Year Action Plan.

- **1 - Goal - Increase both Classified and Certificated Staffing**

Priority Rank:

1

Objectives:

- **1.1 - Objective - Hire full time Chemistry Instructor. Chemistry has been requesting a full-time faculty member for several years now in Program Reviews and Annual plans.**

Hire full time Chemistry Instructor Need: Chemistry has been requesting a full-time faculty member for several years now in Program Reviews and Annual plans.

- The FT/PT target is 75% or higher. According to OIERP data, chemistry over the past 5 years, the FT/PT ratio has averaged 52.4%. For 2021-2022 the ratio for chemistry hit a low of 46.0%
- The impact on our program is that it is often difficult to find not just qualified instructors, but also those with a passion for teaching. Most scientists that earn a Master's degree or higher in chemistry do not want to teach at a community college nor opt to be paid the salary of a teacher when in industry there are much higher paying careers.
- As to how this impacts the success of our students: Last minute replacements are not always the best nor well-prepared instructors. Many times, over the years we have had well qualified and excellent part-time instructors working for us for a few semesters then they get a full-time job, and we must fill their assignment with last minute replacements.
- We have been fortunate that in the hiring process of our part-time (PT) faculty, Dr. Rahbarnia has taken in under her wing to review the

applicants and assist our department chair Dr. Truong in the interview process to help get better qualified instructors.

- Fall 2022: As an example, we lost 3 excellent part-time faculty that were scheduled to teach fall 2022 when they got full time jobs at other colleges, and we were informed a just few weeks before the start of the term and in one case just days. We had to have last minute interviews and schedule changes. We had to rearrange assignments for other faculty, cancel two sections and move several of our CHEM 101 to remote modality since the instructors found did not live in the area. As a department, we know that students that get to have hands-on lab experiences are better off than those that only use virtual experiments.

From reviewing this data, Chemistry is adding the need for a full-time instructor now.

Priority Rank:

2

Original Start Date:

08/01/2022

Original End Date:

09/01/2024

Revised Start Date:

08/01/2022

Revised End Date:

09/01/2024

Responsible Person:

Administration approval

Strategic Direction :

3. Increase Student Success and Equity

Impact Type:

Department

Institutional Learning Outcome:

-- Pick One --

Status Code:

-- Pick One --

Progress Description:**Resource Requests:**

- **1.1.r1 - Hire FT Chemistry Instructor**

Description

Hire full time Chemistry Instructor Need: Chemistry has been requesting a full-time faculty member for several years now in Program Reviews and Annual plans.

Rationale

- The FT/PT target is 75% or higher. According to OIERP data, chemistry over the past 5 years, the FT/PT ratio has averaged 52.4%. For 2021-2022 the ratio for chemistry hit a low of 46.0%.
- We expect the district to approve Lecture/Lab parity in the near future. This will impact our Full-time instructors load and assignments and increase the need for more PT instructors.
- The impact on our program is that it is often difficult to find not just qualified instructors, but also those with a passion for teaching. Most scientists that earn a Master's degree or higher in chemistry do not want to teach at a community college nor opt to be paid the salary of a teacher when in industry there are much higher paying careers.
- As to how this impacts the success of our students: Last minute replacements are not always the best nor well-prepared instructors. Many times, over the years we have had well qualified and excellent part-time instructors working for us for a few semesters then they get a full-time job, and we must fill their assignment with last minute replacements.

- We have been fortunate that in the hiring process of our part-time (PT) faculty, Dr. Rahbarnia has taken in under her wing to review the applicants and assist our department chair Dr. Truong in the interview process to help get better qualified instructors.
- Fall 2022: As an example, we lost 3 excellent part-time faculty that were scheduled to teach fall 2022 when they got full time jobs at other colleges, and we were informed a just few weeks before the start of the term and in one case just days. We had to have last minute interviews and schedule changes. We had to rearrange assignments for other faculty, cancel two sections and move several of our CHEM 101 to remote modality since the instructors found did not live in the area. As a department, we know that students that get to have hands-on lab experiences are better off than those that only use virtual experiments.

From reviewing this data, Chemistry is adding the need for a full-time instructor now.

Resource Type:

Ongoing

Expenditure Category:

Contract Classroom Inst. (1100)

Funded:

No

Funding Source:

First Year Cost/Savings:

\$60,000.00/\$0.00

Second Year Cost/Savings:

\$60,000.00/\$0.00

Third Year Cost/Savings:

\$60,000.00/\$0.00

- **1.2 - Objective - Hire part-time afternoon/evening laboratory technician to obtain equity in all our sections offered. The history of this request: We have been requesting this for over 15 years in all our Program Reviews and Annual plans. At one point about 10 years ago it was approved and supposed to be funded but fell through. This is an important enough issue that we will be requesting this until it is funded.**

Hire part-time afternoon/evening laboratory technician to obtain equity in all our sections offered. The history of this request: We have been requesting this for over 15 years in all our Program Reviews and Annual plans. At one point about 10 years ago it was approved and supposed to be funded but fell through. This is an important enough issue that we will be requesting this until it is funded.

- Lab technicians provide direct assistance with both students and faculty during labs.
- Our full-time lab tech works from 7:30am - 3:30 pm. We do not have any lab support for our afternoon/evening instructors. All daytime sections have lab support for both instructors and students, we are requesting equity in the afternoon & evening sections.
- We commonly have only one lab section each evening, so the instructor is taken away from instructing if they must go into the stockroom for materials or supplies.
- The chemistry lab rooms are very isolated from the rest of the campus, and when there is only one instructor, then they are on their own.
- If the instructor must leave to the restroom during the 3-hour lab, there is no one that can supervise the students. The lab room is usually equipped with the reagents and equipment needed, however, there are times when ice is required for the experiment or that reagents get used and must be replenished.
- This will help in lab efficiency and laboratory safety. Our evening students and instructors need support staff, this allows the instructor to devote their time to students and instruction and increases safety in the lab room.

Priority Rank:

Original Start Date:

08/01/2022

Original End Date:

09/01/2024

Revised Start Date:

08/01/2022

Revised End Date:

09/01/2024

Responsible Person:

Administration approval

Strategic Direction :

3. Increase Student Success and Equity

Impact Type:

Department

Institutional Learning Outcome:

-- Pick One --

Status Code:

-- Pick One --

Progress Description:

Resource Requests:

- **1.2.r1 - Hire 19-hr PT Lab Technician**

Description

Hire part-time afternoon/evening laboratory technician to obtain equity in all our sections offered. The history of this request: We have been requesting this for over 15 years in all our Program Reviews and Annual plans. At one point about 10 years ago it was approved and supposed to be funded but fell through. This is an important enough issue that we will be requesting this until it is funded.

Rationale

- Lab technicians provide direct assistance with both students and faculty during labs.
- Our full-time lab tech works from 7:30am - 3:30 pm. We do not have any lab support for our afternoon/evening instructors. All daytime sections have lab support for both instructors and students, we are requesting equity in the afternoon & evening sections.
- We commonly have only one lab section each evening, so the instructor is taken away from instructing if they must go into the stockroom for materials or supplies.
- The chemistry lab rooms are very isolated from the rest of the campus, and when there is only one instructor, then they are on their own.
- If the instructor must leave to the restroom during the 3-hour lab, there is no one that can supervise the students. The lab room is usually equipped with the reagents and equipment needed, however, there are times when ice is required for the experiment or that reagents get used and must be replenished.
- This will help in lab efficiency and laboratory safety. Our evening students and instructors need support staff, this allows the instructor to devote their time to students and instruction and increases safety in the lab room.

Resource Type:

Ongoing

Expenditure Category:

Nonstudent Hourly (2381)

Funded:

No

Funding Source:

First Year Cost/Savings:

\$30,000.00/\$0.00

Second Year Cost/Savings:

\$30,000.00/\$0.00

Third Year Cost/Savings:

\$30,000.00/\$0.00

- **1.3 - Objective - Part-time Chemistry Instructors: Review applications, interview candidates, hire and schedule instructors.**

Priority Rank:

5

Original Start Date:

08/01/2022

Original End Date:

08/01/2037

Revised Start Date:

08/01/2022

Revised End Date:

08/01/2037

Responsible Person:

Chemistry Faculty & Department Chair

Strategic Direction :

3. Increase Student Success and Equity

Impact Type:

Department

Institutional Learning Outcome:

-- Pick One --

Status Code:

-- Pick One --

Progress Description:

- **2 - Goal - Increase the opportunities for our Chemistry students to succeed**

Priority Rank:

2

Objectives:

- **2.1 - Objective - Increase Chemistry Budget to \$10,000 annually. This request has been on our PR & AP for over 15 years.**

Priority Rank:

1

Original Start Date:

08/01/2022

Original End Date:

08/10/2042

Revised Start Date:

08/01/2022

Revised End Date:

08/10/2042

Responsible Person:

Chemistry Faculty & Staff

Strategic Direction :

3. Increase Student Success and Equity

Impact Type:

District Wide

Institutional Learning Outcome:

-- Pick One --

Status Code:

-- Pick One --

Progress Description:

Resource Requests:

- **2.1.r1 - Increase CHEM Annual Budget to \$10,000**

Description

We request that the annual chemistry budget be increased to at least \$10,000 annually.

Rationale

Our current annual budget is \$6,000. This is not enough for the number of lab sections we offer, and constraints are the daily operational costs of reagents and lab supplies, along with increased costs are increased shipping fees and hazard fees. Replacement costs of items such as broken glassware and contaminated reagents at times becomes an additional constraint. Our Organic Chemistry courses CHEM 212 & 213 will be changing from a 4-unit course with one 3-hour laboratory session per week to a 5-unit course with 6-hours of laboratory per week.

In looking at our scheduling matrix for chemistry lab courses, annually we usually offer 22 sections of CHEM 101 (1 lab per week), 4 sections CHEM 102 (1 lab per week), 8 sections of CHEM 150 and 151 (2 labs per week for each course) & 2 sections of CHEM 212 and 213 (2 labs per week). With the budget at \$6,000, then there is only \$130 for each section, not per lab, per section for all students in the entire section, for all experiments for the entire semester. There are approximately 900 students enrolled in all those sections according to course caps. With a budget of \$6000 that is \$6.67 per student per section.

We request that the annual chemistry budget be increased to at least \$10,000 annually.

A Snapshot History of the Chemistry Annual Budget:

- 1999-2000: \$ 4,430 (2 FT faculty, fewer sections offered and NO OCHEM offered)
- 2005-2018: \$ 3,500 (3 FT faculty, more sections and 6 sections of OCHEM offered)

- 2018-2019: \$ 5,000
- 2019-2020: \$ 20,000
- 2021-present: \$ 6,000

Note: Since the 2007 Chemistry Annual plans and Program Reviews, we have been requesting that our budget be increased to \$10,000. We understand that the CHEM budget for SBVC is at least \$30,000 annually and has increases to the budget frequently.

Resource Type:

Ongoing

Expenditure Category:

Instructional Supplies (4300)

Funded:

No

Funding Source:

First Year Cost/Savings:

\$10,000.00/\$0.00

Second Year Cost/Savings:

\$10,000.00/\$0.00

Third Year Cost/Savings:

\$10,000.00/\$0.00

- **2.2 - Objective - Addressing the Gaps of Equity, Inclusion and Diversity**

Priority Rank:

4

Original Start Date:

08/01/2022

Original End Date:

08/01/2037

Revised Start Date:

08/01/2022

Revised End Date:

08/01/2037

Responsible Person:

Chemistry Faculty & Staff

Strategic Direction :

3. Increase Student Success and Equity

Impact Type:

Department

Institutional Learning Outcome:

-- Pick One --

Actions/Activities:

- **2.2.a1 - Equity: Zero Textbook Cost (ZTC) Courses**

Four of the seven chemistry courses have been redesigned to be Zero Textbook Cost (ZTC). See attachments for details on each course.

Syllabus Statement: This is a Zero Textbook Cost (ZTC) Course! All required materials are posted in Canvas. The information obtained or created for this course is a means of creating student equity and uses materials that cost nothing to students.

CHEM 123: Chemistry for Everyone: Cost saving for student: \$120

CHEM 102: Introduction to Organic Chemistry: Cost saving for student: \$120

CHEM 212: Organic Chemistry I: Cost savings for student: \$ 90 - \$490

CHEM 213: Organic Chemistry II: Cost savings for student: \$ 90 - \$490

Start Date:

08/13/2022

End Date:

08/18/2040

Responsible Person:

Chemistry Faculty

Status Code:

-- Pick One --

Progress Description:

Measurements/Documentation of Progress:

- **2.2.a2 - Closing the Gap through Inclusion, Equity & Diversity:
CHEM 123 Course Redesign Fall 2022**

Closing the gap through Inclusion, Equity & Diversity:

1. The 2022 redesign of CHEM 123 includes areas with an effort to close the gap through inclusion, equity, and diversity.
2. Converting this course to a ZTC course and saving students \$120 to take the course as a means of creating student equity.
3. Implementing a new homework assignment of Chemist Highlight. Chemists were chosen to be highlighted that represents chemists from around the world from diverse backgrounds, cultures and lifestyles.
4. While researching videos for the new ZTC Reading, care was taken to ensure a diverse population was represented as hosts of the videos.
5. Intentional design was used for selecting any images used in the course to represent inclusion, equity, and diversity.

Start Date:

08/13/2022

End Date:

08/18/2040

Responsible Person:

Chemistry Faculty & Staff

Status Code:

-- Pick One --

Progress Description:

Measurements/Documentation of Progress:

- **2.3 - Objective - Acquire instrumentation, materials, and supplies for chemistry experiments to enhance student learning.**

Priority Rank:

6

Original Start Date:

08/13/2022

Original End Date:

08/01/2037

Revised Start Date:

08/13/2022

Revised End Date:

08/01/2037

Responsible Person:

Chemistry Faculty & Staff

Strategic Direction :

3. Increase Student Success and Equity

Impact Type:

Department

Institutional Learning Outcome:

-- Pick One --

Actions/Activities:

- **2.3.a1 - IR Spectrometer**

Research is ongoing as to what type is required. This is on our current watch list, more details to follow.

Start Date:

08/01/2022

End Date:

08/24/2027

Responsible Person:

Chemistry Faculty & Staff

Status Code:

-- Pick One --

Progress Description:**Measurements/Documentation of Progress:****10. Four-Year Action Plan (Goals, Objectives, Resources, and Actions)****Updating this Question is Required on 2Yr. Plans and Optional on SLO Plans**

Rubric Item: Reflect on your responses to all the previous questions. Complete the Four-Year Action Plan, entering the specific program goals ([goal rubric](#)) and objectives ([objective rubric](#)) you have formulated to maintain or enhance your strengths, or to address identified weaknesses. **In writing your objectives and developing your resource requests, take into account student learning and program assessment results.** Assign an overall priority to each goal and each objective. In addition, enter any actions and/or resources required to achieve each objective. (Click here to see a definition of [goals](#), [objectives](#), [actions](#), and how they [work together](#).)

- **1 - Goal - Increase both Classified and Certificated Staffing**

Priority Rank:

1

Objectives:

- **1.1 - Objective - Hire full time Chemistry Instructor. Chemistry has been requesting a full-time faculty member for several years now in Program Reviews and Annual plans.**

Hire full time Chemistry Instructor Need: Chemistry has been requesting a full-time faculty member for several years now in Program Reviews and Annual plans.

- The FT/PT target is 75% or higher. According to OIERP data, chemistry over the past 5 years, the FT/PT ratio has averaged 52.4%. For 2021-2022 the ratio for chemistry hit a low of 46.0%

- The impact on our program is that it is often difficult to find not just qualified instructors, but also those with a passion for teaching. Most scientists that earn a Master's degree or higher in chemistry do not want to teach at a community college nor opt to be paid the salary of a teacher when in industry there are much higher paying careers.
- As to how this impacts the success of our students: Last minute replacements are not always the best nor well-prepared instructors. Many times, over the years we have had well qualified and excellent part-time instructors working for us for a few semesters then they get a full-time job, and we must fill their assignment with last minute replacements.
- We have been fortunate that in the hiring process of our part-time (PT) faculty, Dr. Rahbarnia has taken in under her wing to review the applicants and assist our department chair Dr. Truong in the interview process to help get better qualified instructors.
- Fall 2022: As an example, we lost 3 excellent part-time faculty that were scheduled to teach fall 2022 when they got full time jobs at other colleges, and we were informed a just few weeks before the start of the term and in one case just days. We had to have last minute interviews and schedule changes. We had to rearrange assignments for other faculty, cancel two sections and move several of our CHEM 101 to remote modality since the instructors found did not live in the area. As a department, we know that students that get to have hands-on lab experiences are better off than those that only use virtual experiments.

From reviewing this data, Chemistry is adding the need for a full-time instructor now.

Priority Rank:

2

Start Date:

08/01/2022

End Date:

09/01/2024

Responsible Person:

Administration approval

Strategic Direction (Goal):

3. Increase Student Success and Equity

Impact Type:

Department

Institutional Learning Outcome:

Not Applicable

Resource Requests:

- **1.1.r1 - Hire FT Chemistry Instructor**

Description

Hire full time Chemistry Instructor Need: Chemistry has been requesting a full-time faculty member for several years now in Program Reviews and Annual plans.

Rationale

- The FT/PT target is 75% or higher. According to OIERP data, chemistry over the past 5 years, the FT/PT ratio has averaged 52.4%. For 2021-2022 the ratio for chemistry hit a low of 46.0%.
- We expect the district to approve Lecture/Lab parity in the near future. This will impact our Full-time instructors load and assignments and increase the need for more PT instructors.
- The impact on our program is that it is often difficult to find not just qualified instructors, but also those with a passion for teaching. Most scientists that earn a Master's degree or higher in chemistry do not want to teach at a community college nor opt to be paid the salary of a teacher when in industry there are much higher paying careers.
- As to how this impacts the success of our students: Last minute replacements are not always the best nor well-prepared instructors. Many times, over the years we have had well qualified and excellent part-time instructors working for us

for a few semesters then they get a full-time job, and we must fill their assignment with last minute replacements.

- We have been fortunate that in the hiring process of our part-time (PT) faculty, Dr. Rahbarnia has taken in under her wing to review the applicants and assist our department chair Dr. Truong in the interview process to help get better qualified instructors.
- Fall 2022: As an example, we lost 3 excellent part-time faculty that were scheduled to teach fall 2022 when they got full time jobs at other colleges, and we were informed a just few weeks before the start of the term and in one case just days. We had to have last minute interviews and schedule changes. We had to rearrange assignments for other faculty, cancel two sections and move several of our CHEM 101 to remote modality since the instructors found did not live in the area. As a department, we know that students that get to have hands-on lab experiences are better off than those that only use virtual experiments.

From reviewing this data, Chemistry is adding the need for a full-time instructor now.

Resource Type:

Ongoing

Expenditure Category:

Contract Classroom Inst. (1100)

First Year Cost/Savings:

\$60,000.00/\$0.00

Second Year Cost/Savings:

\$60,000.00/\$0.00

Third Year Cost/Savings:

\$60,000.00/\$0.00

- **1.2 - Objective - Hire part-time afternoon/evening laboratory technician to obtain equity in all our sections offered. The history of this request:**

We have been requesting this for over 15 years in all our Program Reviews and Annual plans. At one point about 10 years ago it was approved and supposed to be funded but fell through. This is an important enough issue that we will be requesting this until it is funded.

Hire part-time afternoon/evening laboratory technician to obtain equity in all our sections offered. The history of this request: We have been requesting this for over 15 years in all our Program Reviews and Annual plans. At one point about 10 years ago it was approved and supposed to be funded but fell through. This is an important enough issue that we will be requesting this until it is funded.

- Lab technicians provide direct assistance with both students and faculty during labs.
- Our full-time lab tech works from 7:30am - 3:30 pm. We do not have any lab support for our afternoon/evening instructors. All daytime sections have lab support for both instructors and students, we are requesting equity in the afternoon & evening sections.
- We commonly have only one lab section each evening, so the instructor is taken away from instructing if they must go into the stockroom for materials or supplies.
- The chemistry lab rooms are very isolated from the rest of the campus, and when there is only one instructor, then they are on their own.
- If the instructor must leave to the restroom during the 3-hour lab, there is no one that can supervise the students. The lab room is usually equipped with the reagents and equipment needed, however, there are times when ice is required for the experiment or that reagents get used and must be replenished.
- This will help in lab efficiency and laboratory safety. Our evening students and instructors need support staff, this allows the instructor to devote their time to students and instruction and increases safety in the lab room.

Priority Rank:

3

Start Date:

08/01/2022

End Date:

09/01/2024

Responsible Person:

Administration approval

Strategic Direction (Goal):

3. Increase Student Success and Equity

Impact Type:

Department

Institutional Learning Outcome:

Not Applicable

Resource Requests:

- **1.2.r1 - Hire 19-hr PT Lab Technician**

Description

Hire part-time afternoon/evening laboratory technician to obtain equity in all our sections offered. The history of this request: We have been requesting this for over 15 years in all our Program Reviews and Annual plans. At one point about 10 years ago it was approved and supposed to be funded but fell through. This is an important enough issue that we will be requesting this until it is funded.

Rationale

- Lab technicians provide direct assistance with both students and faculty during labs.
- Our full-time lab tech works from 7:30am - 3:30 pm. We do not have any lab support for our afternoon/evening instructors. All daytime sections have lab support for both instructors and students, we are requesting equity in the afternoon & evening sections.

- We commonly have only one lab section each evening, so the instructor is taken away from instructing if they must go into the stockroom for materials or supplies.
- The chemistry lab rooms are very isolated from the rest of the campus, and when there is only one instructor, then they are on their own.
- If the instructor must leave to the restroom during the 3-hour lab, there is no one that can supervise the students. The lab room is usually equipped with the reagents and equipment needed, however, there are times when ice is required for the experiment or that reagents get used and must be replenished.
- This will help in lab efficiency and laboratory safety. Our evening students and instructors need support staff, this allows the instructor to devote their time to students and instruction and increases safety in the lab room.

Resource Type:

Ongoing

Expenditure Category:

Nonstudent Hourly (2381)

First Year Cost/Savings:

\$30,000.00/\$0.00

Second Year Cost/Savings:

\$30,000.00/\$0.00

Third Year Cost/Savings:

\$30,000.00/\$0.00

- **1.3 - Objective - Part-time Chemistry Instructors: Review applications, interview candidates, hire and schedule instructors.**

Priority Rank:

5

Start Date:

08/01/2022

End Date:

08/01/2037

Responsible Person:

Chemistry Faculty & Department Chair

Strategic Direction (Goal):

3. Increase Student Success and Equity

Impact Type:

Department

Institutional Learning Outcome:

Unknown

- **2 - Goal - Increase the opportunities for our Chemistry students to succeed**

Priority Rank:

2

Objectives:

- **2.1 - Objective - Increase Chemistry Budget to \$10,000 annually. This request has been on our PR & AP for over 15 years.**

Priority Rank:

1

Start Date:

08/01/2022

End Date:

08/10/2042

Responsible Person:

Chemistry Faculty & Staff

Strategic Direction (Goal):

3. Increase Student Success and Equity

Impact Type:

District Wide

Institutional Learning Outcome:

Unknown

Resource Requests:

- **2.1.r1 - Increase CHEM Annual Budget to \$10,000**

Description

We request that the annual chemistry budget be increased to at least \$10,000 annually.

Rationale

Our current annual budget is \$6,000. This is not enough for the number of lab sections we offer, and constraints are the daily operational costs of reagents and lab supplies, along with increased costs are increased shipping fees and hazard fees. Replacement costs of items such as broken glassware and contaminated reagents at times becomes an additional constraint. Our Organic Chemistry courses CHEM 212 & 213 will be changing from a 4-unit course with one 3-hour laboratory session per week to a 5-unit course with 6-hours of laboratory per week.

In looking at our scheduling matrix for chemistry lab courses, annually we usually offer 22 sections of CHEM 101 (1 lab per week), 4 sections CHEM 102 (1 lab per week), 8 sections of CHEM 150 and 151 (2 labs per week for each course) & 2 sections of CHEM 212 and 213 (2 labs per week). With the budget at \$6,000, then there is only \$130 for each section, not per lab, per section for all students in the entire section, for all experiments for the entire semester. There are approximately 900 students enrolled in all those sections according to course caps. With a budget of \$6000 that is \$6.67 per student per section.

We request that the annual chemistry budget be increased to at least \$10,000 annually.

A Snapshot History of the Chemistry Annual Budget:

- 1999-2000: \$ 4,430 (2 FT faculty, fewer sections offered and NO OCHEM offered)

- 2005-2018: \$ 3,500 (3 FT faculty, more sections and 6 sections of OCHEM offered)
- 2018-2019: \$ 5,000
- 2019-2020: \$ 20,000
- 2021-present: \$ 6,000

Note: Since the 2007 Chemistry Annual plans and Program Reviews, we have been requesting that our budget be increased to \$10,000. We understand that the CHEM budget for SBVC is at least \$30,000 annually and has increases to the budget frequently.

Resource Type:

Ongoing

Expenditure Category:

Instructional Supplies (4300)

First Year Cost/Savings:

\$10,000.00/\$0.00

Second Year Cost/Savings:

\$10,000.00/\$0.00

Third Year Cost/Savings:

\$10,000.00/\$0.00

- **2.2 - Objective - Addressing the Gaps of Equity, Inclusion and Diversity**

Priority Rank:

4

Start Date:

08/01/2022

End Date:

08/01/2037

Responsible Person:

Chemistry Faculty & Staff

Strategic Direction (Goal):

3. Increase Student Success and Equity

Impact Type:

Department

Institutional Learning Outcome:

Unknown

Actions/Activities:

- **2.2.a1 - Equity: Zero Textbook Cost (ZTC) Courses**

Four of the seven chemistry courses have been redesigned to be Zero Textbook Cost (ZTC). See attachments for details on each course.

Syllabus Statement: This is a Zero Textbook Cost (ZTC) Course! All required materials are posted in Canvas. The information obtained or created for this course is a means of creating student equity and uses materials that cost nothing to students.

CHEM 123: Chemistry for Everyone: Cost saving for student: \$120

CHEM 102: Introduction to Organic Chemistry: Cost saving for student: \$120

CHEM 212: Organic Chemistry I: Cost savings for student: \$ 90 - \$490

CHEM 213: Organic Chemistry II: Cost savings for student: \$ 90 - \$490

Start Date:

08/13/2022

End Date:

08/18/2040

Responsible Person:

Chemistry Faculty

- **2.2.a2 - Closing the Gap through Inclusion, Equity & Diversity:
CHEM 123 Course Redesign Fall 2022**

Closing the gap through Inclusion, Equity & Diversity:

1. The 2022 redesign of CHEM 123 includes areas with an effort to close the gap through inclusion, equity, and diversity.
2. Converting this course to a ZTC course and saving students \$120 to take the course as a means of creating student equity.
3. Implementing a new homework assignment of Chemist Highlight. Chemists were chosen to be highlighted that represents chemists from around the world from diverse backgrounds, cultures and lifestyles.
4. While researching videos for the new ZTC Reading, care was taken to ensure a diverse population was represented as hosts of the videos.
5. Intentional design was used for selecting any images used in the course to represent inclusion, equity, and diversity.

Start Date:

08/13/2022

End Date:

08/18/2040

Responsible Person:

Chemistry Faculty & Staff

- **2.3 - Objective - Acquire instrumentation, materials, and supplies for chemistry experiments to enhance student learning.**

Priority Rank:

6

Start Date:

08/13/2022

End Date:

08/01/2037

Responsible Person:

Chemistry Faculty & Staff

Strategic Direction (Goal):

3. Increase Student Success and Equity

Impact Type:

Department

Institutional Learning Outcome:

Unknown

Actions/Activities:

- **2.3.a1 - IR Spectrometer**

Research is ongoing as to what type is required. This is on our current watch list, more details to follow.

Start Date:

08/01/2022

End Date:

08/24/2027

Responsible Person:

Chemistry Faculty & Staff

11. Comments

This space is provided for participants and managers to make additional comments. Comments are not required.

There are no comments for this plan.

12. Supporting Documents

This question is for attaching supplemental materials. Supporting documents are not required.

- [Demographics Chemistry.pdf](#)
- [FT_PT Faculty Ratio Campus & CHEM.pdf](#)
- [PR 22 ILO 3 yr CHC SLOCloud™.pdf](#)
- [sched-matrix-CHEM 2022-2023.pdf](#)
- [PR 22 3 Yr CHEM 150 SLOCloud™.pdf](#)

- [PR 22 GEO 3 yr CHC SLOCloud™.pdf](#)
- [Demographics Campus.pdf](#)
- [PR 22 3 Yr CHEM 151 SLOCloud™.pdf](#)
- [WSCH _ FTEF Campus Ratio Dashboard.pdf](#)
- [2022 CHC Chemistry Mission Statement & Outcome Mapping PLO_GEO_ILO_SLO.pdf](#)
- [PR 22 3 Yr CHEM 123 SLOCloud™.pdf](#)
- [CHEM Completion and Success Rates \(2\).pdf](#)
- [PR 22 3 Yr CHEM 101 SLOCloud™.pdf](#)
- [ZTC Summary CHEM 212.pdf](#)
- [PR 22 3 Yr CHEM 102 SLOCloud™.pdf](#)
- [WSCH _ FTEF Chemistry Ratio Dashboard.pdf](#)
- [2022 Verison CHEM SLO Data Templates.pdf](#)
- [ZTC Summary CHEM 213.pdf](#)
- [PR 22 3 Yr CHEM 213 SLOCloud™.pdf](#)
- [Crafton Hills College Completion and Success Rates \(1\).pdf](#)
- [WSCH _ FTEF Ratio Campus Dashboard \(2\).pdf](#)
- [CHEM Degrees and Certificates Awarded.pdf](#)
- [ZTC Summary CHEM 123 with Lesson Plan.pdf](#)
- [Fill Rate Campus & CHEM.pdf](#)
- [PR 22 3 Yr CHEM PLO Summary SLOCloud™.pdf](#)
- [FT_PT Campus Faculty Ratio.pdf](#)
- [PR 22 3 Yr CHEM 212 SLOCloud™.pdf](#)
- [ZTC Summary CHEM 102.pdf](#)