CUYAMACA COLLEGE

Annual Update Report

Academic - Chemistry (CHEM) - (MS&E)

Address key factors leading to equity gaps and low success rates in Chemistry 120 through data exploration, implementation of course improvements to increase student engagement, and promotion of a variety of support networks and activities. (Goal 1)

Program Goal: Address key factors leading to equity gaps and low success rates in Chemistry 120 through data exploration, implementation of course improvements to increase student engagement, and promotion of a variety of support networks and activities.
Goal Status: Active

Mapping
2022 - 2028 Strategic Plan: *(X)*

- **Increase Equitable Access:** Address key factors leading to equity gaps and low success rates in Chemistry 120 through data exploration, implementation of course improvements to increase student engagement, and promotion of a variety of support networks and activities. (**X**)
- **Eliminate Equity Gaps in Course Success:** Address key factors leading to equity gaps and low success rates in Chemistry 120 through data exploration, implementation of course improvements to increase student engagement, and promotion of a variety of support networks and activities. (**X**)
- **Increase Persistence and Eliminate Equity Gaps:** Address key factors leading to equity gaps and low success rates in Chemistry 120 through data exploration, implementation of course improvements to increase student engagement, and promotion of a variety of support networks and activities. (**X**)
- **Increase Completion and Eliminate Equity Gaps:** Address key factors leading to equity gaps and low success rates in Chemistry 120 through data exploration, implementation of course improvements to increase student engagement, and promotion of a variety of support networks and activities. (**X**)

Summary of Progress or Results
Summary Date: 11/26/2025

Summary of Progress or Results

Summary of Progress or Results: Our Department's Chemistry 120 coordinator, Theresa Carlson, has implemented a significant course redesign to increase student success, retention and engagement. Some aspects of the course redesign include the following:

-Curriculum restructuring to include more interactive learning opportunities.

-Aligning the lab experiences more closely with the lecture content to enhance students' hands-on understanding of core chemistry concepts.

-Weekly learning activities to reinforce lecture material through direct application.

-Creation of a dynamic learning environment with the use of discussion boards and lecture participation tools such as QR codes that allow students to answer questions on their phones throughout the class period, increasing participation.

-Scavenger-hunt style worksheet activities have been implemented over the past year that allow students to move, collaborate, and solve problems interactively.

Immediate textbook access was also recently established in Chem 120 so that students have equitable day-one access to their textbooks and assignments at a significantly reduced cost. This initiative saves students money while preventing access gaps that can derail early success.

This course restructuring is still a relatively new and evolving process, which unfortunately has not yet resulted in increases in student success rates. However, there has been a notable increase in student retention rates over the last few years. There is an upward trend beginning after a 5-year low retention rate of 80% during the Spring 2022 semester. The Fall 2024 and Spring 2025 semesters both show very high retention rates of 88%. This is significant as it shows less students are getting discouraged and withdrawing from the class.

Reporting Period: 2025 - 2026
Status: In Progress - will carry forward into next year
Action steps for this academic year.:
The various elements associated with the Chem 120 redesign outlined above will continue to be refined over this academic year. The scavenger hunt/worksheet model has shown particular promise in its initial implementation, and so there will be a focus on expanding it. Assessment data and student feedback will be used to fine-tune these strategies for maximum impact on student engagement, retention and success.

Program Overview and Update

Lead Author
Robert Anness

Collaborator(s)
Robert Dutnall, Theresa Carlson, Rosana Pedroza

Please briefly share the ways in which you collaborated with colleagues within and outside of your department to gather input to inform your program review.
Robert Dutnall coordinates our general chemistry courses (Chem 141 and 142), Theresa Carlson coordinates our preparatory chemistry course for STEM majors (Chem 120) and Rosana Pedroza coordinates our introductory chemistry course for allied health majors (Chem 102). As coordinators, they are heavily involved in shaping and evolving these classes to close equity gaps and increase student retention and success rates. We collaborate through department-related meetings and one-on-one interactions to share information about these courses and brainstorm ideas for improvement.
Members of our department are also involved in two different communities of practice that meet monthly to discuss student barriers to success, and to share and shape innovative teaching practices with colleagues across the other science departments.
Additionaly, the Department Chairs from our Math, Science, and Engineering Community meet monthly with our Dean to update each other on important issues that affect our area and our college. We also collaborate when scheduling classes to minimize conflicts for students taking classes in multiple STEM disciplines.

Dean/Manager(s)
Tammi Marshall

Please briefly share the ways in which you collaborated with your Dean on your program review to discuss your vision, goals, and resource needs/requests.
As a Department Chair, I meet with my Dean regularly during MSE Chairs meetings and in one-on-one meetings. We regulary discuss issues and needs in the chemistry department, and my Dean has been a great support in that regard. We have also discussed the chemistry budget in collaboration with our senior lab technician, Violeta Casillas, to determine the most pressing needs and determine resource requests based on those needs. We have seen significant enrollment growth in recent years which is promting us to add new chemistry sections. The addition of the new sections will cause a need for an increase in our supplies budget.

Please summarize the changes, additions, and achievements that have occurred in your program since the last program review.
Since the last program review cycle we have implemented Immediate Access in our Chemistry 120 and 141 classes, which ensures that all of these students have equitable, day-one access to their textbooks and publisher platform assignments at a significantly reduced cost. This initiative saves students money while preventing access gaps that can derail early success.
We have also expanded our summer offerings with the addition of a Chemistry 142 class section, which helps keep more students on track with their education plan.
The chemistry department hosted a successful Mole Day event to a packed house on October 23, 2025. The event included chemical demonstrations and fun activities for students to participate in.

Annual Update

Assessment and Student Achievement

After looking at the SLO information for the past year in Nuventive Improve, are you are on track for the 4-year assessment cycle?
Yes

Which courses have not been assessed in the last 4 years?
All SLOs in each of our Chemistry courses have been assessed within the last 4 years.

Please share any outcomes assessment projects your program has worked on in the last year, including SLOs on Canvas, PLOs by ACP, Equitable Assessment Strategies (innovative collective/common assessments, project-based, work-based learning, student-centered, etc.), or other.
Our PLOs were updated recently and we have mapped our course SLOs to the new PLOs (Though this mapping still needs to be submitted to the Outcomes and Assessment Committee). We are currently working on setting up more of our courses to assess SLOs on Canvas. Since we don't currently offer any DE classes in our department, we are trying to figure out the best way to incorporate results from in-person assessments into Canvas. We will touch base regarding this ongoing process at our Department's SLO meeting during the Spring 2026 Professional Development Week.

Student Achievement

Please discuss any equity gaps in access or success and share what the program will do to address them.
Both male and female chemistry students have tended to have success rates that are very close to the overall success rate in chemistry (70%) over the past five years. The average success rate was 71% for female students and 68% for male students, showing no discernible equity gap.
Chemistry success rates with regard to ethnicity were analyzed by comparing success rates of particular groups as a percent difference from the average rates. Comparing our two largest groups first (White, Non-Hispanic and Hispanic), there is a significant equity gap evidenced by their success rates. While white, non-Hispanic students had higher success rates than the overall rate (averaging 10% above average) over the past five years, Hispanic/Latinx students had lower success rates each semester (averaging 12% below average). Other ethnic groups tended to fluctuate above or below the average success rate depending on the semester. This is most likely due to the fact that these groups represent a much smaller percentage of overall enrollment in chemistry, and so the sample sizes are quite small. However, it should be noted that while the success rates for Asian students tended to be above the average most semesters (averaging 8% above), African-American students had below average success rates in six of the past 10 semesters (averaging 15% below average), representing a significant equity gap.
To address equity gaps we are focusing on our introductory chemistry courses, Chem 102 and Chem 120, since they consistently have the lowest success rates. The average chemistry success rate over the past 5 years is 70%, while the avergae success rates in Chem 102 and Chem 120 over the same period are 62% and 50%, respectively. All of our other chemisty courses have average success rates of 80% or above.
Chem 102 is an accelerated class that serves to fulfill the chemistry requirement for Allied Health majors in one semester. Our Chemistry 102 coordinator, Rosana Pedroza, has recently switched to a new textbook that provides more practical examples relating the material to the health care field. Since most of these students aspire to careers in health care, this change can help increase engagement with the course material. In addition, the coordinator has worked to shift a portion of the overall grade percentage in this class toward project-based learning. This not only takes some of the weight off in-person exams as the main assessment tool, but also allows students to choose topics they find interesting for their projetcs, giving them some agency in their education.
In line with our Program Goal, Chemistry 120 is undergoing an even more significant redesign to increase success and retention rates. Some of the changes include more interactive learning activities, aligning the lab experiences more closely with lecture content to enhance students' hands-on

understanding of core chemistry concepts, and weekly learning activities that reinforce lecture material through direct application to improve comprehension and retention. This course restructuring is being led by Theresa Carlson, our newest full-time faculty member and Chemistry 120 coordinator.

Please describe any enrollment changes (increases/decreases) over the past year and the context for these changes.
The Chemistry Program has seen a 30% increase in enrollment since our 5-year low in Spring 2022. Over the past year, chemistry enrollment is up by 15%. Part of the explanation for this upward trend is the bounce back from the COVID-19 era enrollment drop when several class sections were cut. We've been able to add back sections in recent years as enrollments improved, and we are poised to grow more with the addition of new organic chemistry (Chem 231 and 232) sections starting in Spring 2026. High waitlists in Chem 120 and Chem 141 in recent semesters may also prompt us to add new sections of those classes. All of our chemistry classes have laboratory components so this growth necessitates the purchasing of additional lab supplies, chemicals and equipment. The impact of inflation combined with this program expansion has put a strain on our supplies budget, which will need to be increased to accomodate this growth.

Distance Education Course Success (If Applicable)

Program Goals

Program Goals Status
I have updated the progress on my previous goals.

Program Goals Mapping
Mapping for all active Program Goals complete.

Submission

Program Review response is complete and ready for review.
Yes - Response complete and ready for review

Dean Approval and Feedback

I have reviewed the program review with the author and provided feedback.
Yes - Review and feedback complete

Feedback
Here are some overall notes regarding the annual update:
- The work the department is doing to help close achievement gaps and increase retention and success is outstanding. This is a small, but mighty department!
- The change in focus to more project-based assessments is wonderful.
- The growth in this department is nothing short of phenomenal. With an 85% fill rate already for the spring 2026 semester, this department is about maxed out on capacity!
- The change in CHEM 102 to focus the material on health science fields will hopefully make a huge change in course success rates.