



Public Program Review Report

Chemistry (2023/2024)

Co Contributors

Contributor

- Avelar, Amy
- Jones, Carol
- Lillard, Sheri
- Mayo, Ana
- Torrez, Michael

Cover

Program Review Title Chemistry (2023/2024)

Semester Assessed Fall 2023

Area Description:

Chemistry is a scientific discipline that studies the composition, properties, and behavior of matter. It plays a vital role in many industries and helps to develop new technologies and products. Learning chemistry is essential for understanding the natural world, making informed decisions about our environment and health, and developing critical thinking and problem-solving skills. It also leads to exciting career opportunities in fields such as chemistry, chemical engineering, and environmental science, biochemistry, and allied health.

The SBVC Chemistry program is designed to meet the diverse needs of students served by the community college:

1. Students majoring in Chemistry or related fields who are interested in careers in chemical research, pharmaceuticals, environmental science, and more.
2. Students majoring in health sciences who need a strong foundation in Chemistry to excel in their respective fields.
3. Students fulfilling their general education science requirement who desire a thorough understanding of basic chemical concepts and principles.

Courses in the Chemistry Department are taught with a strong emphasis on hands-on laboratory experiences. Our advanced classes provide students with opportunities to use a variety of instruments, enhancing their analytical and problem-solving skills.

Students planning to transfer to a four-year institution will earn an A.S. or A.S-T in chemistry in preparation for a university major in chemistry, biochemistry, or other science fields.

Mission, Vision, and Values:

The SBVC Chemistry Department embodies the Mission, Vision, and Values of the College in various ways. It aligns with the mission by providing an innovative and cohesive educational program for a diverse group of students with

different needs, such as those majoring in Chemistry or related fields, health sciences, and those fulfilling their general education science requirement. The department's emphasis on hands-on laboratory experiences and continuous improvement of lessons, labs, and curricula helps foster a meaningful learning environment.

In alignment with the college's vision, the Chemistry Department contributes to creating leaders in the fields of chemical research, pharmaceuticals, environmental science, healthcare, and more. By actively participating in local professional groups like American Chemical Society (ACS) and STEM-MESA program, the department enhances its support services, further promoting social justice and community advocacy.

The department also reflects the college's values through its commitment to diversity, equity, inclusion, and anti-racism by implementing DEIA work into the chemistry curricula, focusing on improving success rates and addressing racial inequities. By continuously working to improve online instruction, the department promotes open access and equitable learning opportunities for all students. Moreover, the department's collaboration with student support services like the recently strengthened STEM-MESA program fosters a positive campus climate and contributes to participatory governance.

SWOT Micro-Efficiency Program Overview

		Positive	Negative
Internal	Strengths	What are you already particularly good at? What are your advantages?	Weaknesses What areas do you need to improve? What are your disadvantages?
	External	Opportunities What are the factors that can contribute to your success?	Threats What are the potential problems or risk you face?

Strengths:

1. Our department has a strong core of experienced full-time instructors and full-time lab technicians who regularly update lessons, labs, and curricula for improvement.
2. Our SLOs for second semester classes in the General and Organic sequences involve the administration of the ACS standardized exams.
3. Our department is active in our local professional group, the American Chemical Society (ACS) and our SBVC STEM-MESA programs helping to provide our students with strong support services outside of the classroom. These support services help us to reach our department goals including increasing the number of science, and engineering majors and STEM degrees, increasing students' success in chemistry classes and improving outcomes and opportunities for chemistry and science students before/during transfer.
4. Enrollment in CHEM 101 and 105 is growing. The classes feed into science majors programs and nursing programs respectively supporting the entire Science Division.

Weaknesses:

1. Our success rates could be improved. We did make reductions in class caps in 2019 to try to increase success rates and it was effective resulting in a success rate increase from 58% to 63% from the 18-19 to 20-21 school years. This needs to continue to improve. Unfortunately, class caps in CHEM 101 have recently been increased again. There are significant racial inequities in our success rates and changes in curriculum and lesson/lab creation to address this.
2. Our online instruction on average could improve. Like the rest of the campus, we had to make a sudden shift to significantly more online instruction in the wake of COVID. Our average online teaching experience and abilities in the department are improving but will likely need to further improve through training and experience. Good online instruction is important to access and, thus equity.

Opportunities:

1. Recent DEIA work has been undertaken in the Chemistry Dept. and across the Science Division. Science intro classes including CHEM 101, have been updated to include important topics that relate to diversity and equity particularly as they relate to the environment and health care. These improvements to our curricula should translate to increased student interest and success.
2. Many of the students passing through the chemistry program are taking introductory courses such as CHEM 101, 104, and 105 in preparation for nursing and other healthcare fields. The demand for nurses is particularly high right now. California has over 200k job openings for registered nurses alone (labormarketinfo.edd.ca.gov). We have the opportunity to train many local residents to enter the medical field. Work is also underway in both the Chemistry and Nursing programs to address inequities in success rates.
3. The STEM and MESA Programs merged in 2022 to form the current STEM-MESA program and are now serving 100% more students than last year. This strengthening of our student support services should help us to reach many of our department goals.
4. Math and English CHEM 101 and 105 prerequisites were removed as of Fall 2023 allowing for greater, more equitable access for students.

Threats:

1. The shortage of nurses previously mentioned is in large part due to many leaving the field due to burn out. This problem could lead to lowered interest in the field.
2. The move to online for the last couple years has been a difficult adjustment for the Chemistry Department. It is difficult to craft reliable online assessments and, as we have returned, many faculty have noticed that students struggle to demonstrate in-person knowledge that they might seem to have based on some online assessments. Success rates increased last year from 64.8% (21-22) to 71.7% (22-23) but we are expecting to have to work and get creative to maintain it as students continue to return to in-person courses and assessments.
3. Recent increases significant increases in CHEM 101 class sizes have made it more difficult to give personal attention to each student resulting a sharp decrease in students success to 61.6% in Fall 2023.

Goals and Planning

5-year goals and planning

1. Improving student success.
2. Acquiring resources to ensure rigor of curriculum.
3. Further integrating DEIA into our program.

Master Planning

1. **Improving student success.** The success rate is increasing but we would like to increase it further. Recent issues include students enrolling in too many units, students not understanding the time required or not having the appropriate study skills to succeed in Chemistry, and too few workshop facilitators. The new STEM-MESA program will help a lot with this.
2. **Acquiring resources to ensure rigor of curriculum.** Laboratory-based instruction is necessary to ensure quality training for science students, most of whom transfer to 4-year institutions. This laboratory preparation requires both human and financial resources. Challenges include price increases for chemicals/supplies, aging/outdated instrumentation, individual lab drawers for hundreds of students, proper ventilation for fume hoods, and enough personnel to manage experimental setups for > 50 labs/week (Mon – Sat).
3. **Further integrating DEIA into our program.** We have begun work on this by changing the CHEM 101 COR to include units on chemistry and society, environmental justice, and healthcare inequities to directly build DEIA into our introductory chemistry class that constitutes most of our FTES and written new labs and assignments to cover these topics. We are working to improve these instructional resources and expand this work to general chemistry in the future.

Attestations

SLO, PLO, or SAO Outcomes:

Are your outcomes assessed regularly as per the Outcomes Handbook? Yes

Instructional Programs:

Is your curriculum current? Yes

CTE Programs:

Is there continuing demand for the program? N/A

Does the program quality meet industry standards? N/A

Codes and Dates

Originator Lemieux, Jessy