SKYLINE CPR Report

2023 – 2024

SKY Dept - Chemistry

Signature: Bianca Rowden-Quince (Apr 24, 2024 11:54 PDT)

Email: rowdenquinceb@smccd.edu

Signature:

Email: hurlessj@smccd.edu

Signature: Jing Folsom

Email: folsomj@smccd.edu

Signature: Vinicio Lopez (Apr 24, 2024 18:26 PDT)

Email: lopezv@smccd.edu

Program Information

Assessment Unit Information

Program Type

Instructional

Division

Science, Technology, Engineering and Math (STEM)

Assessment Contact

A.J. Bates

Comprehensive Program Review

2023 - 2024

Program Review Update

Fall 2021,Fall 2026

Instructional Comprehensive Program Review

Submitter Name:

A.J. Bates, Joaquin Rivera-Contreras, Susanne Schubert

Submission Date:

03/22/2024

BACKGROUND

1.A. DIVISION:

Science, Technology, Engineering, and Mathematics (STEM)

PROGRAM NAME:

Chemistry

1.B. YEAR OF REVIEW:

2023-2024

1.C. PROGRAM REVIEW TEAM

AJ Bates, Susanne Schubert, Bianca Rowden Quince

1.D. CONNECTIONS TO THE COLLEGE MISSION/VISION/VALUES:

ii. Alignment with the College Values:

Academic Excellence,Student Success and Equity,Community Partnership,Sustainability,Open Access

For each chosen Value, provide a concrete example of how each connects to your program.

Academic Excellence: As a comprehensive community college offering workforce and economic development through career technical education programs and certificates, Associate of Arts and Associate of Science degrees, a Baccalaureate Degree, basic skills development, and lifelong learning, we value excellence in all aspects of our mission. With current, up-to-date, and evolving curricula, we are dedicated to academic rigor and quality. We are committed to fostering an educational environment that values originality, creativity, and the freedom of inquiry, thought, and discussion.

Community Partnership: We place a high value on deep community involvement and work in partnership with local middle and high schools. We are committed to addressing the needs of the labor market and the community because we value our role as a center of academic excellence. The Science in Action lecture series, campus wide chemistry week, and other community outreach programs are all actively supported by the chemistry adjunct and full-time faculty.

Student Success and Equity: We value a culture on campus that emphasizes the idea that students come first, fosters respect among all groups, and values diversity. Every student has access to resources that will help them succeed. Instructors work closely with the STEM Center to provide additional support and resources to students. In collaboration, lab report writing, exam preparation, and focused topic workshops were developed, and peer mentors are regularly embedded in the classes for increased student support. As a result, a welcoming environment is created where students can succeed both academically and personally. Beyond this our faculty is invested in addressing equity gaps in STEM and act as mentors for our diverse student body and actively support and participate STEM programming like IMMERSE in STEM, Women in STEM panels, and undergraduate research.

Sustainability: We value institutional cultures that are dedicated to social justice and environmental sustainability. In our course work, we regularly implement material, e.g., case studies, research projects, and discussions, that addresses these important issues.

Open Access: Regardless of readiness level, socioeconomic status, gender, gender expression, sexual orientation, cultural, religious, or ethnic background, or the presence or absence of a disability, we are committed to providing all members of our community with access to high-quality educational programs and services. We are dedicated to giving students free access to programs and helpful student services, both offline and online, so they can make steady progress toward their objectives. ZTC is now used in all of our courses.

1.E. PROGRAM PERSONNEL

i. Provide the current Full-Time Equivalent (FTE) of each category of personnel:

Full-time Faculty FTE:

3

Adjunct Faculty FTE:

2.8

Classified Professionals FTE:

1.5

ii. Describe any changes in staffing since the last CPR, and how the change(s) have impacted the program. Are there any unmet needs in the program pertaining to program personnel (e.g. staffing, schedule limitations, turnover)? If yes, please specify.

On full-time Chemistry faculty left, and was replaced with a full-time tenure track hire. The Chemistry Department is in the process of hiring an additional FT Chemistry faculty member.

1.F. PROFESSIONAL DEVELOPMENT

i. Summarize key professional development that the program personnel have engaged in since the last CPR to meet both the mission of the program, and the aim of the College to increase equity.

Our PT and FT faculty have participated in the following professional development activities: SLOAC Academy, PTK Advisor Training, QOTL at Skyline College, Faculty participate regularly in workshops of the Royal Society of Chemistry (RSC) and American Chemical Society (ACS); faculty participate in attend conferences e.g. Association for the Advancement of Sustainability in Higher Education (AASHE)

CURRENT STATUS

2.A. ACHIEVEMENTS

Describe the program's achievements since the last CPR.

Successful and/or innovative programming, initiatives and plans:

The Biology and Chemistry Scholars (ETS) learning community fosters a supportive environment for students through dedicated cohort enrollment and close collaboration with the BCS retention specialist. This partnership ensures that students are well-informed about internship and professional development opportunities, setting them up for success in their chosen fields. Additionally, the implementation of Chemistry Jam during both Spring and Fall semesters provides students with valuable supplemental instruction and peer support, further enhancing their learning experience and academic performance.

Fruitful collaborations beyond the program:

The department actively collaborates with various departments across campus to promote undergraduate research, fostering a culture of inquiry and discovery among students. Notably, the department plays a

significant role in organizing the annual uSOAR Conference at Skyline, which showcases the research achievements of undergraduate students and provides them with valuable opportunities to present their work to a broader audience.

New or updated curriculum:

In response to the current data analysis, the department is developing a new late-start problem-solving skills course to complement the CHEM 210 and 220 chemistry courses. This innovative curriculum addition aims to provide students with additional support and resources to enhance their problem-solving abilities, ultimately leading to increased student success in these foundational chemistry courses.

In-reach/outreach efforts:

The department has developed an exciting collaboration proposal involving NASA Blue Marble and San Jose State University, which offers internship opportunities and enhanced mentorship to underrepresented students in STEM. This initiative will provide students with invaluable hands-on experience and exposure to cutting-edge research, working closely with scientists from both institutions. To prepare students for their internships at NASA, the department offers the Chemistry and Interdisciplinary Research course at Skyline, equipping them with the necessary skills and knowledge to succeed in their placements.

Furthermore, the department actively collaborates with the math department, particularly through the MATH Jam program, to increase student preparedness for CHEM 410 and 210. This cross-disciplinary approach ensures that students have a strong foundation in the mathematical concepts required for success in these chemistry courses, ultimately improving student outcomes and retention.

Pandemic response and maintenance of high levels of excellence:

The Chemistry Department recognized that it was critical for our students and for the community to maintain high-quality, hands-on laboratory experiences for our Chemistry students. To achieve that goal, we began using at-home laboratory kits from Carolina and and Hand-on Labs for our Introductory (CHEM 192) General Chemistry (CHEM 210), and Allied Health Chemistry (CHEM 410) in the Fall of 2020. Additionally, we offered General Chemistry 2 (CHEM 220), Organic Chemistry 1 (CHEM 237), and Organic Chemistry 2 (CHEM 238) laboratory classes in-person starting in the Fall of 2020. The department instituted safety protocols and had only one half of the lab meeting in-person on a given lab date, with online activities for students not meeting in-person on those days. These protocols served as a template for other programs returning to campus later.

Technology or operational improvements:

Aging Infrared Spectrometer was replaced with an up-to-date machine

New degrees, certificates, and/or pathways:

Approval of AS Chemistry Degree is in-progress

2.B. IMPACTS ON PROGRAM

Describe the impacts on your program (positive or negative) by legislation, regulatory changes, accreditation, grantors, community/school partnerships, college-wide initiatives, stakeholders, and/or other factors.

AB 705:
The Chemistry department has updated all of its course outlines to reflect the changes in prerequisite courses. The Chemistry department has a Chemistry Jam intensive preparation course in the week before

each semester start to help students prepare mathematically for our courses. We are developing late-start supplement courses to assist students who need help with math and problem-solving in Chemistry courses.

AB 1111:
Most of our Chemistry courses are numbered consistently with CSM and Cañada College. However, our Organic Chemistry courses are not consistently numbered. Skyline College offers Organic Chemistry courses as separate lab and lecture courses. We find this the most useful to our students and offers them significant flexibilty to those students whose programs do not require the labs. It also allows students to take the lab in a semester following the lecture, if that is better for their schedules and ability to enroll in all of the courses that they will need to graduate and/or transfer. We will have to coordinate with the other colleges in the district to resolve this discrepancy.

ACCESS

3.A. PROGRAM ENROLLMENT

What enrollment trends do you observe, and what may account for these trends?

Enrollment by Race/Ethnicity (first 3 largest %), and gender:

CHEM 192: Asian 27.2 %, Filipino 20.4 %, Hispanic 27.6 % - Female 52.4 %, Male 45.9 %, unreported 1.7 %

CHEM 210: Asian 28.0 %, Filipino 21.8 %, Hispanic 24.2 % - Female 48.2 %, Male 49.8 %, unreported 2.1 %

CHEM 220: Asian 33.4 %, Filipino 20.8 %, Hispanic 21.1 % - Female 54.2 %, Male 43.8 %, unreported 2.1 %

CHEM 234: Asian 41.2 %, Filipino 16.5 %, Hispanic 19.6 % - Female 60.0 %, Male 37.6 %, unreported 2.4 %

CHEM 235: Asian 44.7 %, Filipino 14.1 %, Hispanic 21.2 % - Female 61.2 %, Male 37.6 %, unreported 1.2 %

CHEM 237: Asian 42.5 %, Filipino 18.3 %, Hispanic 19.2 % - Female 60.7 %, Male 37.0 %, unreported 2.3 %

CHEM 238: Asian 46.4 %, Filipino 15.2 %, Hispanic 20.5 % - Female 60.9 %, Male 37.7 %, unreported 1.3 %

CHEM 410: Filipino 31.2 %, Hispanic 29.7 %, White 13.4 % - Female 71.1 %, Male 27.2 %, unreported 1.7 %

3.B. EQUITABLE ACCESS

Provide an analysis of how students, particularly historically disadvantaged students, are able to access the program. Specific questions to answer in your response:

i. PROGRAM ACCESS: How do your program enrollment demographics compare to that of the College as a whole and/or Division? What differences, if any, are revealed? What program, institutional, and/or external factors may have impacted equitable access, whether positively or adversely?

Enrollment trends by race/ethnicity are similar to the college overall.

ii. COURSE ACCESS: Provide analysis of enrollment trends for each course. Which course(s) have declining enrollment, and why might that be the case? What insights do you gain from the impact of course offering patterns?

Overall course enrollment is decreasing; a decrease of 36.8% from 2017-18 with 1262 to 2021-2022 of 798 is observed.

Enrollment Trends: comparing sum of FU 17 to SP 18 (AY 17/18) and FU21 to SP 22 (AY 21/22). For this the sum of headcount for the applicaple semesters was calculated and then used to calculate the percent difference. headcount and percent difference data is shown below.

CHEM 112: only offered SP 18 and SP 22 - not enough data

CHEM 114: only offered FA 17, FA 19, FA 21 - not enough data

CHEM 192: AY 17/18: 144 AY 21/22: 48 %difference: 66.7 % decrease

CHEM 210: AY 17/18: 364 AY 21/22: 231 %difference: 36.5 % decrease

CHEM 220: AY 17/18: 117 AY 21/22: 77 %difference: 34.2 % decrease

CHEM 234: AY 17/18: 53 AY 21/22: 35 %difference: 34.0 % decrease

CHEM 235: AY 17/18: 36 AY 21/22: 19 %difference: 47.2 % decrease

CHEM 237: AY 17/18: 45 AY 21/22: 31 %difference: 31.1 % decrease

CHEM 238: AY 17/18: 29 AY 21/22: 15 %difference: 48.3 % decrease

CHEM 410: AY 17/18: 255 AY 21/22: 199 %difference: 22.0 % decrease

We see an decreased enrollment in all chemistry courses offered. One particular issue might be that students decided to postpone taking chemistry courses during the pandemic. Students prefer to take the chemistry courses in a face to face modality due to the heavy lab component. Eventhough at-home lab kits can be used to subliment some experiences they have been proven to be inadequate to mimic a real life laboratory work environment and the training on essential laboratory equipment.

Therefore the decrease in the higher level chemistry courses 220 and up is a direct result of the lower enrollment in chemistry 210.

The decrease in the enrollement in CHEM 192 could be the direct effect of the removal of CHEM 192 as a prerequesite for CHEM 210.

iii. What efforts, if any, have been made to increase equitable access to your program? If more is needed, consider making it one of your program goals in the Action Plan.

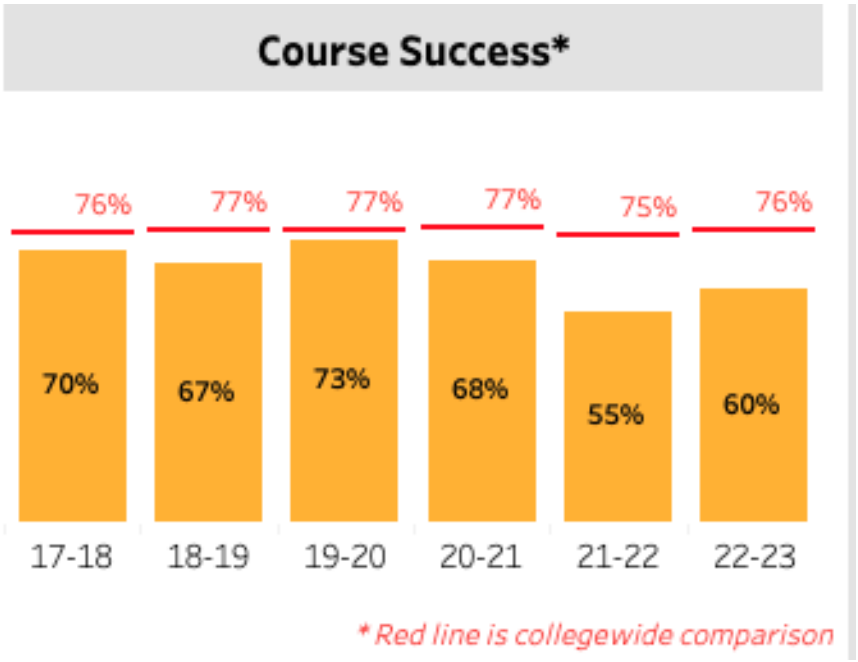
We are developing late-start supplements for General Chemistry to assist students who need additional assistance in math and problem-solving. We continue to work closely with the STEM Center to institute embedded tutoring, STEM Center Tutoring, and Student Success workshops.

EFFECTIVENESS

4.A. OVERALL AND DISAGGREGATED COURSE SUCCESS RATES

Comment on course success rates and with particular attention to any observed equity gaps. Specific questions to answer in your responses:

i. How do the overall course success rates compare to the College and/or Division success rates?



The chemistry overall success rate is lower than the college success rate. There are many factors that play into this:

1) the district wide decision to remove the CHEM 192 pre -requisite for CHEM 210. Which as a result places students in a high paced, high volume chemistry class without any previous chemistry exposure.

2) AB 705 has a direct impact on the performance of students in the entry level chemistry classes. Therefore as a comparison students success rates for mathematics are included in the below table as well. The success rate in chemistry is slightly lower than for mathematics but follows the same trend. Students low math confidence directly impacts their ability to transfer and apply concepts in chemistry, especially in entry level chemistry classes.

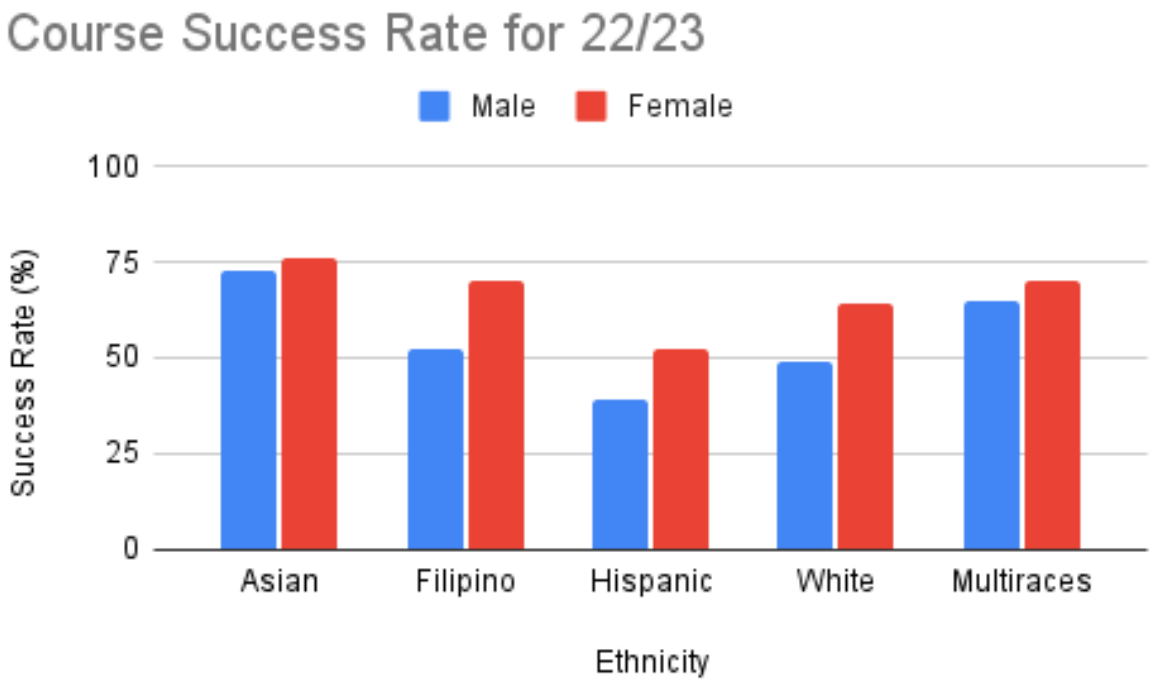
The female students perform slightly better (success rate 70%) than male and unreported, whos success rates are close together (65% and 66%, respectively), and follow the trend of the College overall (77% , 75%, and 76%, respectively).

Ethnicity	CHEM Success rate (%) 21/22	CHEM Success Rate (%) 22/23	MATH Success Rate (%) 22/23	CHEM Total Success 17/18 - 22/23 (%) Rate	College Total Success Rate (%)
Asian	65	75	82	78	85
Black / African American	N/A	40	47	67	64
Filipino	55	61	65	67	76

Hispanic/Latinx	47	47	53	57	71
Pacific Islander	N/A	N/A	67	51	66
White	60	59	66	69	80
Multiraces	49	68	61	64	76
Unknown	48	50	73	65	78

In the above table the success rates for chemistry 21/22, 22/23 and 17/18 through 22/23 are presented, to include suitable comparison Math and College success rates are also included.

ii. What have you learned from reviewing the overall and disaggregated course success data? Choose disaggregations which are most relevant to programming decisions (e.g. ethnicity, gender, age, enrollment status, and/or disaggregations that are unique to your program).



Lowest success rate for Hispanic - male students. Throughout all ethnicities male student perform slightly lower than female students, with a drastic difference for Filipino students here the success rate for female students is about 20% higher than for male students, which gives rise to concern. A similar observation can be drawn for Hispanic and White students, here the success rate for female students is about 13% and 15 % higher , respectively. (Not enough data for Black/African American and Pacific Islander Student population in 22/23)

For the 22/23 the 291 female, 242 male and 10 unreported students enrolled in chemistry courses. During this academic year, 112 seeked tutoring suppport in the STEM Center, with the following distribution female: 67 (60%) , not Declared: 3, male: 42 (38 %). Even though more female students enroll in chemistry courses, accounting for approximately 54% of total enrollment, and slightly fewer male students, accounting for approximately 44%, a lower percentage of male students use the college's support services.

4.B. INDIVIDUAL COURSE SUCCESS RATES

Provide analysis of success rates for each active course. Is there a minimum success rate that you consider acceptable, and if so, what is it and why? Which courses are not at the acceptable minimum success rate? Which exhibit a success rate over time that fluctuates fairly dramatically? Which other courses are of concern to you, and why?

2017-2018 to 2021-2022

Success Rate by Course	SU17	FA17	SP18	SU18	FA18	SP19	SU19	FA19	SP20	SU20	FA20	SP21	SU21	FA21	SP22	Total Success Rate	Total Withdraw Rate
CHEM-112			90%												100%	92%	8%
CHEM-114		73%						92%						71%		80%	3%
CHEM-192	67%	58%	43%	76%	45%	54%	77%	61%	63%		69%	77%	73%	64%	52%	62%	20%
CHEM-210	75%	56%	67%	82%	57%	54%	69%	59%	69%	79%	68%	62%	60%	46%	41%	61%	25%
CHEM-220	94%	48%	81%	57%	42%	58%	48%	44%	62%		54%	39%		31%	45%	55%	32%
CHEM-234		68%	48%		72%	79%		69%	77%		67%	54%		81%	53%	66%	24%
CHEM-235		53%	95%		72%	84%		75%	81%		52%	90%		44%	40%	72%	18%
CHEM-237		68%	61%		76%	82%		83%	89%		83%	74%		69%	78%	77%	18%
CHEM-238		71%	93%		88%	95%		100%	100%		71%	90%		67%	78%	88%	10%
CHEM-410	90%	88%	86%	90%	84%	81%	97%	82%	93%	82%	74%	60%	75%	49%	62%	79%	13%

The courses that we are most concerned about the success rate in is the Introductory and General Chemistry sequence (CHEM 192-210-220). We are currently working with the STEM Center to maintain and expand embedded tutoring and student success workshops in these courses. We are also in the process of creating a study course to accompany Genral Chemistry 1 to focus on problem-solving.

4.C. COURSE AND PROGRAM SLO RESULTS

What notable conclusions were drawn from the assessment results? If available, note any differences in assessment results by key disaggregations (e.g. modality, learning communities, etc.). What have been the implications for the program? Specific questions to answer in your response:

i. What percentage of course SLOs have been assessed during the past five years?

Number of Course SLOs:

25

Percentage:

88

ii. How well is the program meeting its PSLOs?

The program is still meeting the PSLO's. Some PSLO's have not been assessed especially connected to Allied Health.

iii. Are the PSLOs still relevant to your program? If not, what changes might be made?

Yes

iv. Drawing from the last six years of course SLO assessment, which course(s) and/or course SLO(s) are of concern (e.g., not met or inconclusive results, those with action plans)?

N/A

4.D. COURSE ENHANCEMENTS

Which course(s) are of concern due to their course success rates, SLO results, and/or other reasons? What efforts, if any, have been made to enhance student learning in those courses? If more is needed, consider which changes may be submitted to the Curriculum Committee in the Fall, and/or making it one of your program goals.

The success rate for CHEM 192, 210, and 220 are of concern. The chemistry department increased their collaboration with the STEM Center to offer more chemistry peer tutoring as well as embed tutors directly in

the classroom. A new goal is to create late start problem solving courses to accompany these courses of concern.

4.E. DEGREES AND CERTIFICATES

List each of the degrees and certificates separately. Comment on the number and trends in degrees/ certificates awarded by your program. Specific questions to answer in your responses:

i. What do the data reveal about degree and certificate completion? time to completion?

The Chemistry Department currently does not have an active AS Degree or AST Degree.

Our college curriculum cannot meet the Chemistry AS-T requirements due to the total number of Math and Physics units for our local courses exceed the allowable number for the AS-T degree.

An AS in Chemistry degree has been approved locally. The Chemistry Department is in the process of getting it ready for submission to the State Chancellor's Office.

ii. What changes do the data suggest are necessary for the program to explore?

Potential late-start supplement courses

4.F. LABOR MARKET CONNECTION

If appropriate for your program, given labor market data related to your program, discuss current labor trends and how your program is addressing them. How are you incorporating any of the following into program planning: Labor Market and Trends (e.g., Centers of Excellence, Burning Glass), Performance for CTE Programs (Launchboard), and/or Advisory Boards? Report out on whichever source(s) are relevant to your program.

According to Lightcast Analysis on sample occupations related to our program (Chemist, Chemical Engineer, Biochemist and Biophysicist, Chemical Technician, Chemical Equipment Operator and Tender, Chemical Plant and System Operator), we discovered that the skills associated with these occupations remained consistent over time and can be viewed as baseline skills in communication, research, data analysis, problem solving, Excel, and writing. All of our courses include a laboratory component that focuses on communication, problem solving, writing, and data analysis. Our students are currently being taught how to interpret and communicate the data collected during the experiment using Excel.

4.G. STUDENT FEEDBACK

Describe how and when feedback was solicited from students, whether qualitative or quantitative, and what the results reveal. If feedback was scant, describe the attempts made and speculate why.

Student feedback was not available for the Pregram Review Report. Though Chemistry faculty designed a survey for the program review in Summer 2023, it was not made available for administration by PRIE until February 2024, which was after the due date for the draft CPR report and did not afford the department adequate time to administer and interpret the results prior to the dealine for the final draft. If possible, we can administer in advance of the PRU.

4.H. CURRICULUM

Programs are required to update all curriculum and secure approval by the Curriculum Committee. Please indicate whether the following tasks have been completed.

Secured approval of updated courses by the Curriculum Committee

Yes

Updated the Improvement Platform with new and/or changed SLOs, after approval by the Curriculum Committee

Yes

Submitted a current assessment calendar with all active courses to the Office of Planning, Research, and Institutional Effectiveness

Yes

Reviewed, updated (as needed), and submitted degree and certificate maps to the Curriculum Committee

Yes

KEY FINDINGS

Using key findings based on the analysis from this CPR cycle, develop a multi-year plan designed to improve program effectiveness and promote student learning and achievement. Commit to three-to-five new and/or ongoing goals total. Enter goals via Step 2: Goals and Resource Requests.

5.A. CHALLENGES AND CONCERNS

Considering the results of this year's CPR assessment, identify challenges, concerns, and areas in which further action is needed. Reference relevant sections of the CPR that provide further insight.

The Chemistry Department is in the process of developing late-start supplement courses, an AS degree in Chemistry, and is in the hiring process for a new FT faculty member. We expect to continue and expand cooperation with the STEM Center to provide embedded tutoring for Chemistry students.

GOAL

Supplemental Math Course

Goal and Desired Impact on Students

Create a supplemental Math course as a late start for CHEM 210 to support and built student math skills.

Year Initiated

2023 - 2024

Implementation Step(s) and Timelines

1) Consult Physics regarding their Supplemental Math courses. (23-24)
2) Identify key topics that students most need assistance in. (23-24)
3) Develop Course Outline (Fall 24)
4) Curriculum Committee Approval (Fall 24)
5) Develop Curriculum (Spring 2025)
6) Pilot Supplemental Course (Fall 2025)

GOAL

OER Revisions and Implementations

Goal and Desired Impact on Students

Revise existing OERs and Implement Additional OERs for all Chemistry Courses

Intended to reduce the costs to students and maintain high quality

Year Initiated

2023 - 2024

Implementation Step(s) and Timelines

Review current in-house laboratory manuals and update and revise as needed.

GOAL

NASA / SJSU / Skyline College / Blue Marble Space Partnership

Goal and Desired Impact on Students

Laboratory Internship for Chemistry Students at NASA / Ames

Year Initiated

2023 - 2024

Implementation Step(s) and Timelines

Fall 2023 - Grant Proposal
Summer 2024 - Implementation

GOAL

Student Success

Goal and Desired Impact on Students

Although success and retention rates have increased among all ethnic groups, success for African American, Hispanic/Latino and Pacific Islanders are lower than the departmental average. This shows that additional resources for student support and tutoring outside of the classroom are needed to improve student success in Chemistry courses. This might include hiring tutors, embedded tutors, offering learning skills supplement courses, supplemental instruction sessions, continue the partnership with the Math, Engineering and Science Achievement (MESA) program, partnering with existing campus learning communities and student support programs such as the Learning Center and re-instituting the CHEM 192 prerequisite for CHEM 210. In the CHEM 210 course we might implement a recitation session to increase student success.
Given that the prerequisite of CHEM 192 for CHEM 210 has been removed, it will be even more critical for students to be properly advised into the appropriate initial chemistry course and to provide the additional support for students who go directly into CHEM 210 without first completing the recommended CHEM 192.

Hiring tutors and embedded tutors, offering learning skills supplement courses, supplemental instruction sessions, continue the partnership with the Math, Engineering and Science Achievement (MESA) program and partnering with existing campus learning communities and student support programs such as the Learning Center have been implemented. We will expand on this by working with the STEM Center. Re-instituting the CHEM 192 prerequisite for CHEM 210 has not been implemented because the other two colleges are not implementing it. In the CHEM 210 course a recitation session has been implemented to increase student success.

Create a supplemental Math course as a late start for CHEM 210 to support and built student math skills.

Year Initiated
2021 - 2022

Resource Request

Division Name
Science, Technology, Engineering, and Mathematics (STEM)

Year of Request
2022 - 2023

Resource Type
Faculty Position (permanent)

Resource Name
New Full-time Faculty Hire

Resource Description
New Full-time Faculty Hire

Funds Type – Mark all that apply.
Recurring Cost

Briefly explain how this request helps to advance the goals and priorities of your program, the College, the District, and/or the California Community College Chancellor's Office.
A new full-time faculty member is needed. The FTE/PTE ratio is under 50% for the chemistry department. The hiring of a new full-time faculty member would be of great help to continuing to build and develop the coursework and expand department resources and improve student learning. In addition, having an additional full-time faculty member would help with the continuity of instruction within the chemistry program.

A new full-time faculty member has not been added. We still need it. We submit a request for this every year but the request has not been granted. (Note: the Spring 2021 Chemistry faculty hire was a replacement position, for a faculty member who left in Spring 2020.)

Cost
100,000

Level of need, with 1 being the most pressing
1

FOR ADMINISTRATIVE USE ONLY

GOAL

Up-to-date Chemistry Laboratory

Goal and Desired Impact on Students

Maintain an Up-to-date Chemistry Laboratory with fully functional equipment and necessary supplies to fulfill the SLO's, and to prepare students for upper-division chemistry courses and the chemistry workforce.

Year Initiated

2022 - 2023

Implementation Step(s) and Timelines

Purchase new FTIR and GC/Recorder Device

Resource Request

Division Name

Science, Technology, Engineering, and Mathematics (STEM)

Year of Request

2022 - 2023

Resource Type

Supplies

Resource Name

Chemistry Supplies Budget

Resource Description

Chemistry Supplies Budget Increase needed

Funds Type – Mark all that apply.

Recurring Cost

Briefly explain how this request helps to advance the goals and priorities of your program, the College, the District, and/or the California Community College Chancellor's Office.

Increases in the number of laboratories and increases in the cost of chemicals and equipment over the last few years should also be met with an increase of a budget to both purchase materials and chemicals.

Additionally, a long-term plan for allocating resources for maintaining, purchasing and replacing laboratory equipment is essential to staying current and being able to teach with modern technology. The budget for supplies has not been increased in some time. It is currently at ~17,000 / year. Some new equipment has been purchased from these yearly allocations.

Cost

25,000

Level of need, with 1 being the most pressing

2

FOR ADMINISTRATIVE USE ONLY

Resource Request

Division Name

Science, Technology, Engineering, and Mathematics (STEM)

Year of Request

2022 - 2023

Resource Type

Instructional Equipment

Resource Name

New FTIR Instrument

Resource Description

A new Fourier transform Infrared Spectrometer and the associated software is needed to replace old equipment that is no longer functioning

Funds Type – Mark all that apply.

One-time Cost

Briefly explain how this request helps to advance the goals and priorities of your program, the College, the District, and/or the California Community College Chancellor's Office.
FTIR is a critical skill for students ins Organic Chemistry. It is required for students to meet the SLO's for CHEM 237 & CHEM 238, and prepare them for transfer and the chemistry workforce.

Cost
33,000

Level of need, with 1 being the most pressing
1

FOR ADMINISTRATIVE USE ONLY

Resource Request

Division Name
Science, Technology, Engineering, and Mathematics (STEM)

Year of Request
2022 - 2023

Resource Type
Instructional Equipment

Resource Name
GC & Recorder

Resource Description
A new Gas Chromatograph & Recorder unit are needed

Funds Type – Mark all that apply.
One-time Cost

Briefly explain how this request helps to advance the goals and priorities of your program, the College, the District, and/or the California Community College Chancellor's Office.
Gas Chromatography is a critical skill for students in Organic Chemistry. It is required for students to meet the SLO's for CHEM 237 & CHEM 238, and prepare them for transfer and the chemistry workforce.

Cost
15,000

Level of need, with 1 being the most pressing
3

FOR ADMINISTRATIVE USE ONLY

GOAL

Increase Student Success Rates

Goal and Desired Impact on Students
In alignment with the state chancellors office's goals for 2030, the chemistry department works toward the goal of equity in support.

Year Initiated
2023 - 2024

Implementation Step(s) and Timelines

Create a supplemental Math course as a late start for CHEM 210 to support and built student math skills. To do so, the chemistry department will follow the below steps:
1) Consult Physics regarding their Supplemental Math courses. (23-24)
2) Identify key topics that students most need assistance in. (23-24)
3) Develop Course Outline (Fall 24)
4) Curriculum Committee Approval (Fall 24)
5) Develop Curriculum (Spring 2025)
6) Pilot Supplemental Course (Fall 2025)

Although success and retention rates have increased among all ethnic groups, success for African American, Hispanic/Latino and Pacific Islanders are lower than the departmental average. This shows that additional resources for student support and tutoring outside of the classroom are needed to improve student success in Chemistry courses. This might include hiring tutors, embedded tutors, offering learning skills supplement courses, supplemental instruction sessions, continue the partnership with the Math, Engineering and Science Achievement (MESA) program, partnering with existing campus learning communities and student support programs such as the Learning Center and re-instituting the CHEM 192 prerequisite for CHEM 210. In the CHEM 210 course we might implement a recitation session to increase student success.
Given that the prerequisite of CHEM 192 for CHEM 210 has been removed, it will be even more critical for students to be properly advised into the appropriate initial chemistry course and to provide the additional support for students who go directly into CHEM 210 without first completing the recommended CHEM 192.

Hiring tutors and embedded tutors, offering learning skills supplement courses, supplemental instruction sessions, continue the partnership with the Math, Engineering and Science Achievement (MESA) program and partnering with existing campus learning communities and student support programs such as the Learning Center have been implemented. We will expand on this by working with the STEM Center. Re-instituting the CHEM 192 prerequisite for CHEM 210 has not been implemented because the other two colleges are not implementing it. In the CHEM 210 course a recitation session has been implemented to increase student success.

Mapping
- SKY Strategic Goals: (X - Hightlight Selected)
  - Antiracist and Equitable Institution: X
  - Civic Mindedness Cultivation: X
  - Student Support and Resources: X
  - Thriving Environment: X

GOAL

Increase Student Participation in Internship Opportunities

Goal and Desired Impact on Students
In alignment with the state chancellors office's goals for 2030, the chemistry department works toward the goal of equity in success.

Year Initiated
2023 - 2024

Implementation Step(s) and Timelines

Create a NASA / SJSU / Skyline College / Blue Marble Space Partnership. The chemistry department will work together with SJSU and Blue Marble Space to create a dedicated internship program for community college students. That heavily focuses to prepare community college students for a full time summer research internship at NASA Ames. Students will gain the scientific foundations and research skills needed to successfully work at a national laboratory with a strong mentor support at Skyline as well as at NASA.

Fall 2023 - Grant Proposal
Summer 2024 - Implementation

Increase the collaboration with the BCS retention specialist to track students participation in internships and support their publication and communication.

Mapping

- SKY Strategic Goals: (X - Hightlight Selected)
  - Antiracist and Equitable Institution: X
  - Civic Mindedness Cultivation: X
  - Increased Student Enrollment: X
  - Thriving Environment: X

GOAL

Increase the equitable access to up-to-date chemistry instructional materials.

Goal and Desired Impact on Students

In alignment with the state chancellors office's goals for 2030, the chemistry department works toward the goal of equity in access.

Year Initiated

2023 - 2024

Implementation Step(s) and Timelines

Maintain an Up-to-date Chemistry Laboratory with fully functional equipment and necessary supplies to fulfill the SLO's, and to prepare students for upper-division chemistry courses and the chemistry workforce.
To do so, the chemistry department needs to update their instrumentation and purchase new FTIR and GC/Recorder Device.

The chemistry department will consult regularly with the ZTC committee on updates on new and free instructional materials.

Mapping

- SKY Strategic Goals: (X - Hightlight Selected)
  - Antiracist and Equitable Institution: X
  - Student Support and Resources: X
  - Thriving Environment: X