



Program Review All Fields

Chemistry [1]

Main

Overview

Academic Year 2023 - 2024

Originator Moller, Rachel

Division Curriculum Division 10 - Liberal Arts and Sciences

Department Natural Sciences & Math

Program Chemistry

Program Type Instructional

Co-Contributors

Contributor

- Yuh, Patrick

Program Mission and Accomplishments

Gavilan College Mission Statement

Gavilan College actively engages, empowers and enriches students of all backgrounds and abilities to build their full academic, social, and economic potential.

Provide a brief overview of how the program contributes to accomplishing the mission of Gavilan College. In addition to a basic overview of your program's structure and services, be specific in connecting your program's services to elements of the mission statement (300 words or less).

The chemistry program allows students to investigate properties and the ways in which they interact, combine, and change. The program engages students by helping students develop logical and critical thinking skills using the principles of Bloom's taxonomy (**academic potential**) and helps students make career choices (**social and economic potential**). We offer courses for non-majors who need the GE, majors who may want to transfer to a 4-year college, and health science students who seek a career in nursing/allied health. The STEM III grant supports our efforts by offering supplemental instruction for many chemistry courses (**academic and social potential**), faculty mentors who meet with students throughout the semester (**academic and economic potential**), and a STEM Center to serve as a space for learning and collaboration with other students and faculty (**academic and social potential**).

On the PIPR website, locate and review your previous program plan and subsequent annual updates.

After studying, please list:

Response and follow-up to previous program reviews

1. **The previous chemistry program plan was not submitted in 2019-2020**
- 2.
- 3.

Have the services of your program changed over the past three years? Please explain (300 words or less).

The significant change that the chemistry programs has made over the past three years is that coursework is offered online, while the laboratory component is in-person. This empowers students to have more control over their schedules (**social and economic potential**), while allowing a larger population of individuals to engage in college (**academic potential**). This enriches and empowers students to balance their personal and academic responsibilities.

Student and Program Outcomes

College Goal for Student Achievement

The following questions refer to data regarding student achievement.

Find your discipline's course success information. Consider your department success rate trends over the last three years. Compare your overall success to the college average.

Are these rates what you expected after comparing with the college average? Are there any large gaps? Is there anything surprising about the data? What trends are suggested by the data?

Area: Fall 19, Fall 20, Fall 21

Natural Science: 71%, 71%, 70%

Gavilan: 69%, 70%, 70%

On average, the department success rates appear to be in line with the college success rate.

Now find your division persistence information. Consider your retention rate trends over the last three years. Compare your overall retention to the college average.

Are these rates what you expected after comparing with the college average? Are there any large gaps? Is there anything surprising about the data? What trends are suggested by the data.

Path: Tableau - Program Review/ Equity - D2. One Year Persistence Rate

Area: Fall 19, Fall 20, Fall 21

Natural Science: 83%, 84%, 84%

Gavilan: 87%, 86%, 83%

On average, the department success rates appear to be in line with the college success rate.

These rates are expected, since they are in agreement with the college average.

Success

The following questions refer to data regarding student achievement.

What are your set goals for course success? Do your individual course and department rates meet this goal?

Helpful Question: If your rates for success are lower than your goals, what are your plans to improve them (200 words or less)?

Path: Tableau - Program Review/ Equity - D3. Course Rates by Unit

Area: Fall 19, Fall 20, Fall 21

Chemistry: 76%, 83%, 79%

The overall goal of the chemistry department is to have a success rate of at least 80%. Chemistry 1A, 1B, 12A, and 12B are over the goal of 80% success rate. Chemistry 30A has had a much lower than desired success rate (about 73%). Improvements for the chemistry 30A course would be to include embedded tutoring, more outreach about tutoring services, and have an increased use of online resources.

How many students did your area serve (if you don't have an exact count, please provide an estimate)? How did they perform in comparison to those that did not use your services, if applicable? Given this information, how has your service or area supported student success and retention over the past three years (200 words or less)?

See Success and Retention dashboard in Tableau's Program Review section.

Area: Fall 19, Fall 20, Fall 21

Chemistry (by census): 394, 428, 345

Equity

Equity

Gavilan College has identified the following populations as experiencing disproportionate outcomes: Males, African American, Native American, Students with Disabilities and Foster Youth.

For EOPS/ CalWORKs, MESA, TRiO, Puente, and VRC: LOCATE Success and Retention dashboard in Tableau's Program Review section. Examine your equity results over the last three years. If there are differences in success rates and/ or retention across groups, comment on any differences in success rates across groups. Helpful Questions: What current factors or potential causes can be connected to these areas of disproportional impact? How might your program or department address student equity gaps (200 words or less)?

For all other areas, how can your area help increase disproportionate student success? Contact your support team for any needed assistance in interpreting these data (200 words or less).

Please find Equity information in Tableau's Success and Retention dashboard.

Contact your support team for any needed assistance in using Tableau.

Outliers:

Year→			
Ethnicity ↓ (https://en.wikipedia.org/wiki/%E2%86%93#:~:text=The%20arrow%20symbol%20%E2%86%93%20may%2Cdownward%20direction%20a%20relative%20direction)	2019-2020	2020-2021	2021-2022
Hispanic/LatinX	-6%	-2%	-2%
Black or African American	-6%	+7%	+2%
Unknown	-7%	-3%	-15%

Our Equal Employment Opportunity (EEO) Plan States

"Ensuring equal employment opportunity involves creating an environment that fosters cooperation, acceptance, democracy, free expression of ideas and is welcoming to persons of all gender expressions, persons with different abilities, and individuals from all ethnic and other groups protected from discrimination."

What is your area doing to support district efforts in creating an inclusive college environment? With what departments are you partnering? Did you identify barriers and institute change? How is you creating/ ensuring diversity in your department or in the classroom?

Some examples might be sponsoring cultural events and diverse speakers on issues dealing with diversity, exploring how to infuse diversity into the classroom and curriculum, integrating diversity into the evaluation of employees, promoting learning opportunities and personal growth in the area of diversity, or evaluating how the physical environment can be responsive to diverse employee and student populations.

- the hires over which we have most influence are PT faculty
- we design the interview questions for PT faculty, and have input for the FT faculty interview questions
- we highly value diversity in our program/department
- however, demand > supply for faculty/staff

so, we often lack the ability to consider diversity in our hiring (i.e. we have to take whomever we can get)

Find your Distance Education success information. If distance education is offered, consider any gaps in success rates between distance education and face-to-face courses. Do you notice any trends? Do these rates differ?

Path: Tableau Program Review/ Equity D9. Course Success Rates Locate your department. Filter by Delivery Methods

Helpful question: If disparity exists, how do you plan on closing the achievement gaps between distance education and face-to-face courses (300 words or less)?

During the 2018-2019 academic year, the success rate for Chemistry was 79.5%, during the first year of the pandemic (2019-2020), the success rate was 78.5%. During the 2020-2021 academic year, the success rate was 83.2% and during the 2021-2022 academic year, the success rate was 75.7%

Chemistry 30A has been regularly below the success rate of the other courses. During the 2021-2022 academic year, chemistry 30A, 12A and 12B were below the success rate of the chemistry courses. During

the 2021-2022 academic year, the chemistry department did not have a full-time faculty member, which could have been a reason to see the success rate drop.

Overall, the chemistry 30A course seems to be below the success rate of the other chemistry courses; we have addressed this issue at other points in this program review.

Learning and Area Outcome

Have you reviewed all of your Service Area Outcomes (SAOs) to ensure that they remain relevant for evaluating the performance of your area?

Are your SAOs mapped in curiQunet?

No

Are your SAOs up to date in curriQunet?

Yes

Have your SAOs been assessed in the last five years?

Yes

Have you reviewed all of your SAOs to ensure that they remain relevant for evaluating the performance of your area?

Yes

If you answered no to any of the above questions, what is your plan to bring your assessments into compliance (200 words or less)?

Currently, there is no ability to map SLOs to ILOs on CirricUNET

Outcome Assessments

Services Area Outcomes (SAO)

Review your SAOs data located in curriQunet. What is your department's acceptable achievement score goal for each outcome?

For the chemistry department, the acceptable achievement score would be 80%. However the more ideal number would be 83%.

Institutional Learning Outcomes (ILO)

How do your SAO support the college ILOs? Be specific (200 words or less).

The chemistry courses support the instructional learning outcomes in the following ways:

Critically thinking and creativity: The chemistry courses offered at Gavilan involve complex problem-solving topics. Since chemistry is a physical science, it is fact-based coursework. Students are expected to synthesize chemical compounds in the laboratory portion of the course. Students are also expected to formulate ideas and hypothesis from what is being learned in the classroom.

Communicate effectively: Both the students and instructors in the chemistry department are respectful to one another. Both the students and instructors listen to one another and are always actively learning.

Practice social responsibility: Students work together in and out of the classroom, to reach a common goal; understanding the material. The instructors work with the students as well, to ensure that the students have the tools and knowledge they need to be successful. The chemistry department ensures that students feel safe and welcome and respect diversity.

Cultivate well-being: Although rigorous material, the chemistry department values students' mental and

physical health and ensure that students are able to balance their education with their personal lives. The chemistry department affirms and promotes positive individual and communal identities through creating a collaborative work environment.

Are you meeting your SAO success goals? What patterns stand out in your results? If your SAO results are lower than your goals, what are your plans to improve them (200 words or less)?

The success goals for chemistry courses are as follows:

Course	Success %	Meeting Goal
Chemistry 30A	76.3	No
Chemistry 30B	85.7	Yes
Chemistry 1A	85.9	Yes
Chemistry 1B	90.1	Yes
Chemistry 12A	93.2	Yes
Chemistry 12B	95.0	Yes

Overall, the courses are meeting the ideal goal of 83%. The outlier is chemistry 30A, which is below the desired success goal. Plans to improve this goal is to ensure students have access to tutoring through the STEM center. Since chemistry 30A is an introductory level chemistry course, it is important that students have the tools they need to be successful in the modality the course is offered. If face-to-face, it is important that the students are able to attend all lectures to not get behind on the material. If the course is offered as a hybrid course, where the lecture is online, it is important that the Canvas course is easy to navigate and the expectations and deadlines are clear.

Curriculum and Course Offerings Analysis

Are there plans for new courses or educational awards (degrees/certificates) in this program? If so, please describe the new course(s) or award(s) you intend to propose (200 words or less).

Provide your plans to either inactivate or teach each course not taught in the last three years (200 words or less).

Consider and analyze your location, time, and delivery method trends. Are classes offered in the appropriate sequence/ available so students can earn their degree or certificate within two years? Are courses offered face-to-face as well as have distance education offerings? Are they offered on the main campus as well as the off-site areas? Different times of day? (300 words or less).

Program and Resource Analysis

Please list the number of Full and Part Time faculty, staff and/ or managers/ administrator positions in this program over the past three years. Focus on your individual program.

Program and Resource Analysis

1. **2020**

How many students did your area serve in this year (if you don't have an exact count, please provide an estimate)?

345

Full Time Faculty

1

Part Time Faculty

5

Full Time Staff

0

Part Time Staff

1

Full Time Mgr/Admin

1.00

Part Time Mgr/Admin

0.00

2. **2019**

How many students did your area serve in this year (if you don't have an exact count, please provide an estimate)?

506

Full Time Faculty

1

Part Time Faculty

3

Full Time Staff

0

Part Time Staff

1

Full Time Mgr/Admin

1.00

Part Time Mgr/Admin

0.00

3. **2018**

How many students did your area serve in this year (if you don't have an exact count, please provide an estimate)?

497

Full Time Faculty

1

Part Time Faculty

3

Full Time Staff

0

Part Time Staff

1

Full Time Mgr/Admin

1.00

Part Time Mgr/Admin

0.00

Faculty Percentages**Percentage Full to Part Time Faculty**

Year:2018

FT = 25.00%

PT = 75.00%

Year:2019

FT = 25.00%

PT = 75.00%

Year:2020

FT = 16.70%

PT = 83.30%

How have and will those with reassigned time, grant commitments and activity, projected retirements and sabbaticals affect personnel and load within the past in the next three years? What future impacts do you foresee (200 words or less)?

In 2020, full time Professor Dale Clark retired. In the fall of 2022, Rachel Moller (previously Snelling) was hired as a full time chemistry faculty member. At the end of the Spring 2023 term, a long-time part time faculty member who has a 65% full time teaching load will retire.

Additional Comments**Evaluation of Resource Allocations**

List the resource allocations from all sources (e.g., annual college budget request appropriations, Guided Pathways funds, grant funds, etc.) received in the last three years. For annual college budget request appropriations, reference your previous three-year plan and annual updates.

Please evaluate the effectiveness of the resources utilized for your program. How did these resources help student success and completion? For college budget request appropriations, list the result of the evaluation strategy outlined in your previous three-year plan and annual updates. For all other sources of funding, list the results of the evaluation strategy contained within the program or grant plan.

Did you receive additional funds?

No

Program Productivity

Program Productivity Measurements

Determine the number of students you assist annually. Using the data provided by the business office, calculate your average cost effectiveness per student. If you do not have student contact, please fill out Total allocated budget and Total spending.

- **2023 - 2024**

Total Number of student contacts

503

Total allocated budget

Total spending

Total cost per student (Student Contact/ Total Spending)

- **2022 - 2023**

Total Number of student contacts

503

Total allocated budget

Total spending

Total cost per student (Student Contact/ Total Spending)

- **2021 - 2022**

Total Number of student contacts

503

Total allocated budget

Total spending

Total cost per student (Student Contact/ Total Spending)

Year and Student count

Evaluate your program costs. Are your costs in alignment with your budget? If not, what improvements can be made? Please explain any trends in spending, inconsistencies and unexpected results.

The costs for the chemistry program are within the supply budget of \$4,000.00 annually. Most glassware and chemicals are already purchased. The 2022/2023 and 2023/2024 years are projected since there is no data on how many students have been served during those years.

Integrated Planning and Initiatives

What other areas is your program partnering with (i.e. guided pathways, grant collaboration, etc.) in new ventures to improve student success at Gavilan College? What is the focus of this collaboration? Helpful question: What are the department and your Integrated Planning/ Guided Pathways partners' plans for the next three years (200 words or less)?

The chemistry department works closely with the other natural science programs as well as math to develop a STEM community at Gavilan. Chemistry is an integral part of the STEM guided pathway. The chemistry program also works closely with the STEM center at Gavilan College to build more tutoring support for the chemistry courses, since there is a lack of. The focus of this partnering is to improve the success rate of the chemistry courses, especially for chemistry 30A, which is still working on achieving the goal success rate of the chemistry program. The chemistry program is also planning on putting forth effort in improving online education tools (such as LMS, open-education resources) for students to be able to navigate online learning. Chemistry is also actively working on making chemistry courses accessible for those who do not think they can succeed in an online or hybrid learning environment.

Other Opportunities and Threats

Review for opportunities or threats to your program, or an analysis of important subgroups of the college population you serve. Examples may include environmental scans from the Educational Master Plan, changes in matriculation or articulation, student population, community and/ or labor market changes, EMSI data and etc. Helpful Question: What are the departmental plans for the next three years (200 words or less)?

The chemistry department will be looking for new part-time faculty. There will be a retirement at the end of the spring 2023 term, which will leave the chemistry department understaffed. We want to expand but need sufficient *facilities, lab tech support, and part-time faculty* to anchor the program and ensure a successful expansion.

What are you discovering about instruction and/or services in this remote environment that you would want to maintain post-pandemic?

The need for online coursework is evident. Students prefer to have chemistry lectures asynchronous, so they can continue their education while working to financially support themselves. If the coursework remains hybrid, there needs to be some support the students can receive inside the classroom, likely during their scheduled laboratory meeting period.

What kinds of issues are exacerbated or emerging that are likely to remain, unless addressed?

Students need extra educational support around very demanding chemistry coursework. Time management seems to be a concern. Another concern that is emerging is the ability for students to retain information. This can be addressed through more instructor support during the scheduled lab periods and assigning different types and styles of work.

Additional Questions

Please consider providing answers to the following questions. While these are optional, they provide crucial information about your equity efforts, training, classified professional support, and recruitment.

1. Does your division (or program) provide any training/mentoring for faculty and/ or classified professionals regarding professional development?

Yes

2. If there is a need for more faculty and/ or classified professional support in your area, please provide data to justify request. Indicate how it would support the college mission and college goals for success and completion.

Yes. We will have a long time part-time faculty member retiring and we will need to hire someone for that position to support the student course requirements.

3. What, if anything, is your program doing to assist the District in attracting and retaining faculty and classified professionals who are sensitive to, and knowledgeable of, the needs of our continually changing constituencies, and reflect the make-up of our student body?

We participate in hiring committees for classified and faculty positions in our program. Everyone in the Chemistry program values having staff who understand the nature of our student body and can work to nurture their growth and development.

4. Are there program accomplishments/ milestones that have not been mentioned that you would like to highlight?

None at this time

Please share any recommendations for improvements in the Program Integrated Plan and Review process, analysis, and questions. Your comments will be helpful to the PIPR Committee and will become part of the permanent review record.

The word count on this program was not accurate to the maximum number of words. The answers were severely shortened due to the word/character count.

Goals

Three-Year Program Plan Goals

1. Improve Equity in the Chemistry Curriculum

Connection of Goal to Mission Statement, Strategic Plan (http://www.gavilan.edu/administration/master_plan/docs/SP_GoalsStrategiesDraft-final.pdf) and SAO Results

Outliers:

Year→			
Ethnicity ↓ (https://en.wikipedia.org/wiki/%E2%86%93#:~:text=The%20arrow%20symbol%20%E2%86%93%20may,downward%20direction%2C%20a%20relative%20direction)	2019-2020	2020-2021	2021-2022
Hispanic/LatinX	-6%	-2%	-2%
Black or African American	-6%	+7%	+2%
Unknown	-7%	-3%	-15%

The success rate for Hispanic/LatinX and African American students has fluctuated, but seems to be below average for Chemistry. We are unsure why they have not done as well as other groups.

Mission Statement: working towards an environment where all students are achieving their goals

Proposed Activity to Achieve Goal**

If we can identify the causes/factors, we can address this equity gap.

Responsible Party

Dean, STEM Dept Chair, full time chemistry faculty.

Fund amount requested. If a collaboration, what % required from each partner?

None

Total Three Year Resource Allocation Request

0

Timeline to Completion Month / Year

May 2025

How Will You Evaluate Whether You Achieved Your Goal

This goal can be evaluated through data and the success rate of these populations.

Executive Summary

Please provide a brief executive summary regarding program trends and highlights that surfaced in the writing of this report. Summarize, using narrative, your program goals for your next three years. Your audience will be your Peer Review Team, the PIPR Committee, President's Cabinet, Dean's Council, ASGC, Academic Senate, Budget Committee and Board of Trustees (300 words or less).

The chemistry program has higher success rates (82% vs 59%) and retention rates (91% vs 71%) than the college average. We have set forth program goals to increase the success rate to 85%. This goal will improve student achievement and equitable access to resources. The chemistry program is able to allow services funded through STEM III. We will be able to offer the students targeted services, such as counseling, tutoring, and technology lending to help reach our goal of bringing the success rate to 85%. Overall, the demand for chemistry courses is increasing (based on census enrollment) so the outreach and support to students will be critical in their success in the program. With this increase, we will need to ensure to have lab support to set up and prepare the labs, equipment, and reagent. The success of the program is dependent upon the lab support staff. To ensure that the chemistry program is able to achieve an increase in the success rate of the course, our goal is to map the chemistry course PLOs, which can affect the SLOs per course. Mapping out the PLO's can give more continuity throughout the program, which can increase the student success rate. Mapping the PLO's will have a trickle-down effect to update the course SLO's. This goal will help ensure that students are taking relevant and high-quality courses.

Attach Files

Attached File