

Instructional Comprehensive Program Review: 2023-24 Health Sci Program Review

Cover

Overview

Program Review Year 2024**Title** 2023-24 Health Sci Program Review**Year of Last Comprehensive Review****Year of Last Mini Update, if applicable****Originator** Hays, Lisa**Area Dean** Antoinette Herrera**Division**

Math, Sci. & Engineering

Department

Biology

Subject

- BIOL - Biology

Is this a review for a degree/certificate or all the courses in the subject?**Degree**

- General Studies with Emphasis in Health Science, Associate in Arts - Active

Co-Contributors

*Co-Contributor must be chosen before proposal is launched

- Chen, May
- Ernst, Darcy
- Gonzalez, Alfred
- Green, Adam
- Herrera, Antoinette
- Kurushima, Jennifer
- Pang, Lisa
- Pouncil, Matais
- Savageau, Margarita
- Tavana, Azita

Overview

Evergreen Valley College guides all students to pathways that reach their educational and career goals through equity-centered, innovative academic programs and support services. By creating a learning environment where everyone feels welcomed and supported, we are committed to a culture of inquiry, growth, and respect that creates an equitable society in which all can participate and prosper.

1.Student-Centered: We provide access to quality and efficient programs and services to ensure student success.

- Access
- Curriculum and programs
- Services

2. Community Engagement: We will transform the college image and enhance partnerships with community, business and educational institutions.

Areas of focus are:

- Increase visibility
- Develop strategic partnerships
- Building campus community

3.Organizational Transformation: We create a trusting environment where everyone is valued and empowered.

Areas of focus are:

- Communication
- Employee development
- Transparent Infrastructure

- **1. Provide a brief summary of your program. Please include a brief history and discuss any factors that been important to the program's development.**

When Evergreen Valley College opened in 1975, two career technical education programs were highlighted and fully supported by the newly formed San Jose/Evergreen Community College District. Those two programs were the Automotive and Nursing Programs. After 50 years, those programs have flourished and are now recognized throughout the Bay Area for producing top quality graduates.

In 1999, hundreds of students enrolled in EVC with the intention of becoming nurses and started their two years of preparatory work. The pre-requisites for applying to nursing school included three rigorous, 5-unit biology courses: Anatomy, Physiology and Microbiology. At that time, the Nursing Program accepted only 60 students each year, and not all those students were from EVC. What happened to the students who did not receive a coveted position in the EVC nursing program? They left EVC with 60+ units of course work and no degree.

In 2012, the Health Science Program was created to provide an Associate in Art (AA) degree to those students. The General Studies with an Emphasis in Health Science major is now the #2 major at EVC. In 2022, 509 students were declared Health Science majors and 50 students graduated with a Health Science degree from EVC.

Health Science students do not only intend to be nurses. Many students want to be respiratory therapists, dental assistants, and ultrasound technicians. The Health Science Program was designed for students interested in pursuing all types of Allied Health careers. Career opportunities for this program are expected to grow 13% in the next 10 years with an aging society and a new endemic.

- **2. Please provide an update on the program's progress in achieving the goals (3 years) set during the last comprehensive program review.**

This is the first program review for the General Studies with an Emphasis in Health Science program.

- **3. Please state and recent accomplishments for your program and show how it contribute to the College's mission and success.**

Accomplishments

The biology department strives to work towards EVC's mission. Starting in Fall of 2019 our department revamped our Human Anatomy courses with the goal of making the class more student-centered and equitable. Previously, the anatomy courses at EVC had a low student success rate (success rate was on average 57.2%) which extended student time to completion as most students re-enrolled in anatomy multiple times in order to fulfill the requirements for the Health Science degree. As a direct result of our curriculum and pedagogical changes, we were able to increase student success rate to 75-90%. Much of this progress is due to changes and interventions that are explicitly student-centered. Dr. Jennifer Kurushima, the lead anatomy instructor, has a strong background in fostering student science identity and community building within the classroom setting, as evidenced through her latest scholarly publications on pre-health student science identity (Perkins et al., 2023 (<https://onlinelibrary.wiley.com/doi/abs/10.1002/tea.21902>)) and biology education research in community colleges (Alvares et al., 2022 (<https://www.lifescied.org/doi/full/10.1187/cbe.22-07-0145>)), and recent interview in the Chronicle of Higher Education on the importance of classroom social connections (Supiano BF, 2023 (<https://www.chronicle.com/article/the-social-classroom>)). When redesigning this course, the anatomy team used evidence-based best practices to explicitly promote equity, inclusion, and a growth mindset in our pre-health students. As anatomy is the foundational course for the pre-health series, our hope is that our students carry these lessons and support with them as they continue their journey towards their future careers.

We have also redone our Human Physiology courses to include more clinical cases (in the form of case studies) as a way for students to connect with the theories presented in lecture and encouraging a more student-centered curriculum. Physiology focuses on processes that are often challenging to understand without experiments and concrete examples. In Fall 2023, we replaced a lab with a discussion section where students will be given examples of how they can apply the theory they learn to a real-life medical case. We intend to evaluate the extent to increased student success in our next program review.

New learning activities designed to increase student interaction and collaboration with both their peers and their instructors in hybrid biology course were implemented in two sections of our microbiology course in the spring and summer of 2022. These activities included video-based student discussions, video-based instructor feedback, and a text-based discussion framed by the practical inquiry model. Survey and interview data collected from the student participants were encouraging and suggested that the implementation of these activities promoted student perceptions of social presence and also increased their perceptions of classroom community. Students also reported higher levels of comprehension of the material when engaging in video-based activities compared to standard quiz and exam assessments, although the former activities require a significantly larger time investment to complete. Additionally, in collaboration with the Northern California branch of the American Society for Microbiology, EVC microbiology students are invited to attend the fall and spring

meetings each year with three students attending at no cost, and additional students invited at a subsidized cost. These meetings introduce students to current microbiology research, scientists, and health care providers working in the field. We intend to continue to monitor the impact of these activities on student success in our next program review.

- **4. If you received resource allocation for your last program review cycle, please indicate the resources you received and how these resources were utilized to impact student success and / or importance to your program. (The resources can be personnel or fiscal)**

The Health Science Program did not ask for funds in the last review cycle.

- **5. Please describe where you would like your program to be three years from now (program goals) and how these support the college mission, strategic initiatives and student success.**

Goal 1: Write an OER for human physiology lab manual.

With our curriculum development, human physiology faculty were able to drop one of two lab manuals, making it cheaper for students. However, physiology students still need to purchase a textbook and lab manual. Faculty will reduce these financial barriers for students by curating, writing, and/or adopting OER resources so this course is ZTC.

Goal 2: Offer more sections of human anatomy to meet the needs of our students.

As one of the most heavily impacted courses on campus, a major challenge for anatomy is the limited space and budget. The anatomy lab can safely accommodate 25 students per section, yet we routinely have waitlists as long (or longer) than 25 – meaning with enough space and financial support, we could easily double our offerings of anatomy sections. According to our end-of-semester survey, one of the most impactful aspects of our course is the cadaver dissection project, where teams of students under the guidance of their professor dissect a cadaver. Acquiring and maintaining a cadaver is expensive, and requires specialized equipment, laboratory space, and maintenance. Our current cadaver dissection theater is quite small and limits our ability to offer additional sections of anatomy. To offer additional sections of anatomy, we will need additional laboratory space and an expanded cadaver dissection theater.

Goal 3: Regular maintenance schedule for lab equipment.

Because we use microscopes so frequently during microbiology labs, the microscopes require maintenance every 6 months. Additional equipment used in the microbiology lab, such as spectrophotometers, water baths, autoclaves, and incubators also require regular maintenance. With regular maintenance, these items can be used in the lab for 5-20+ years. Without regular maintenance, however, the lifespan of our equipment drops dramatically, with costly replacement fees. Our microbiology microscopes, for example, cost \$5000 each, and we use 24 microscopes in the microbiology lab each day. The pandemic has been disruptive to education.

Goal 4: Increased budget.

Supplies for the three pre-nursing courses are expensive and equipment requires consistent maintenance and replacement. Because the biology department has been historically underfunded, much of the equipment is in dire need of maintenance and/or replacement.

Goal 5: Extended tutoring hours in the Biology Skills Lab.

Faculty in the pre-allied health courses find students increasingly unprepared for the rigors of challenging college courses. Extended tutoring hours would help, especially during the summer, when the tutoring center is closed. Additionally, the Biology Skills Lab currently provides tutoring to students from 9AM to 3PM, which does not fully accommodate our students who only have evening availability. To extend the hours of the Skills lab, the Health Science Program will be asking for an additional, part-time 30 hr/week, 11-month Instructional Support Assistant Lab Lead.

Goal 6: Workshops for pre-health students in the Biology Skills Lab.

The skills lab is a location where the Health Science Program can offer workshops for students planning to work in the Allied Health fields. With the Skills Lab located directly across the hall from the Nursing Department, this would be an easy way for nursing faculty to share their experiences with their future students. The skills lab can also support a mentoring program to help students effectively plan to apply to nursing school.

Goal 7: Career counseling in Human Anatomy, Physiology and Microbiology.

Most students come without a clear idea of (1) a specific career goal, and (2) understanding of the skills and requirements needed to apply for programs in healthcare (such as nursing programs, respiratory therapy programs, etc.). Each of the three pre-health courses should include some career advising during the semester. This could be done with guest speakers, assignments, and service-learning projects. Although most students are not clear, there are a handful who are currently working directly with patients in their current jobs. Those students can be mentors for students unsure about their career pathway.

Program Set Standards

Overall, EVC's Institution Set Standard for success rate is 72%, and the aspirational goal for student success is 75%.

Success Rate (completion with "C" or better)	Program	EVC	Program Set Standard (established during last comprehensive PR)	Program Success Goal (new)
F'16-F'22 average		72.31%		

Program Success Rate 68.16%

Program Set Standard: It is recommended that programs identify a success standard. This standard should reflect the baseline success rate.

Program Set Standard 61.34%

Recommendation: 90% of the 6 year average success rate could be your program standard (average x 0.9).

Program Success Goal: It is recommended that programs identify a success goal. This goal should reflect the success rate to which your program aspires.

Program Success Goal 71%

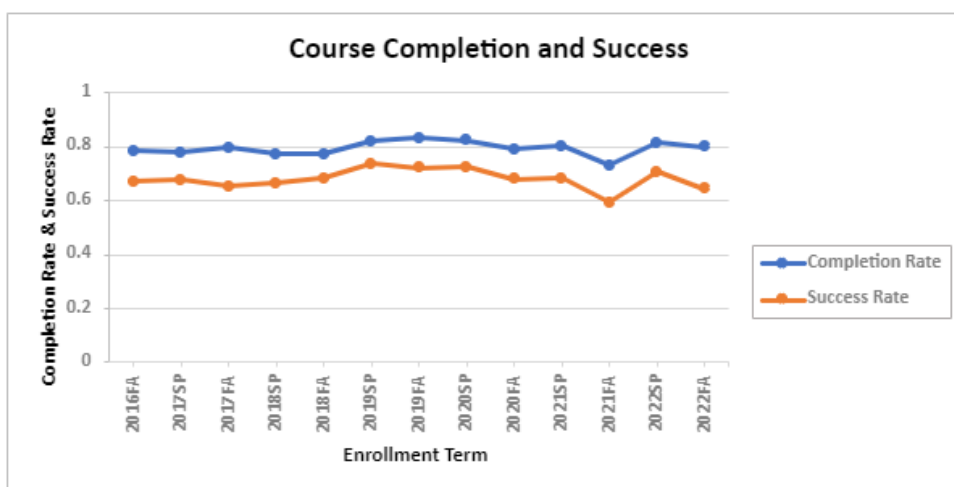
- Is your program success rate higher or lower than the campus?

Our program success rate is 4.15% lower than the campus.

- **If your success rate is higher than the campus, how are you helping students succeed in and outside the classroom? If your program success rate is lower, what are some strategies your program is implementing to improve?**

Our success rate is currently lower (-4.15%) than the campus success rate. In our department, full-time instructors are working closely with one another and our associate faculty to design course syllabi and schedules for each course. This allows us to standardize our course content and student learning outcome evaluations across different sections of each course and ensure adherence to our course outlines of record. Additionally, our department regularly reviews our Student and Program Learning Outcomes in order to identify and target weaknesses and improve our course and program materials. Our department faculty members also regularly participate in Early Alert in order to identify students who may need additional tutoring or support to be successful in our courses. Students have also reported that the Biology Skills Lab plays a significant role in their success in our health science-related courses. Biology student tutors and the models and materials used in our health science courses are made available to students in the Skills Lab to help them prepare for practicals and exams. Currently, however, the Skills Lab is only open from 8am – 3pm Monday to Friday. These limited hours act as a barrier to success for our evening students and we are requesting an additional instructional support assistant position to increase student access to the Skills Lab.

Health Science Degree Average Course Completion and Success Rates (2016 – 2022):



- **Is the current program success rate higher than the program set standard?**

Our current program success rate is 6.82% higher than the program set standard.

- **How close is the program to meeting the program success goal?**

Our average program success rate is currently lower than our program success goal (-2.84%). Although our success rate fluctuates from semester to semester, ranging from a low of 59.26% in fall 2021 to a high of 73.9% in spring 2019, our program success rates have been consistent, with a noticeable drop in fall 2021, likely due to the return to on-campus learning after the completion of the COVID-19 prevention emergency addendum.

- **Are these measures (program set standard and program success goal) still current/accurate? If not, please describe here and reset the standards.**

Yes – the program set standard and program success goal are still current and accurate.

Success Rates: Measures by IPEDs Race/Ethnicity

- **American Indian: 91 - 75.500%**
Program Average Total Enrolled
3.000
Program Success Rate
75.000
- **Asian: 9182 - 79.970%**
Program Average Total Enrolled
281.000
Program Success Rate
75.620
- **Black or African American: 455 - 61.770%**
Program Average Total Enrolled
12.000
Program Success Rate
62.020
- **Hawaiian/Pacific Islander: 85 - 62.970%**
Program Average Total Enrolled
3.000
Program Success Rate
53.970
- **Latinx: 8952 - 64.890%**
Program Average Total Enrolled
216.000
Program Success Rate
58.870
- **Two or More Races: 609 - 70.560%**
Program Average Total Enrolled
21.000
Program Success Rate
64.490
- **Unknown: 1397 - 72.850%**
Program Average Total Enrolled
29.000
Program Success Rate
65.250

- **White: 1207 - 73.590%**
Program Average Total Enrolled
37.000
Program Success Rate
72.590

Success Rates: Measures by Gender

- **Female: 12034 - 74.070%**
Program Average Total Enrolled
407.000
Program Success Rate
68.200
- **Male: 9868 - 70.160%**
Program Average Total Enrolled
192.000
Program Success Rate
68.030
- **No Value Entered: 76 - 72.420%**
Program Average Total Enrolled
2.000
Program Success Rate
74.310

Success Rates: Measures by Age

- **17 & Below: 791 - 87.140%**
Program Average Total Enrolled
6.000
Program Success Rate
84.150
- **18-24: 14936 - 69.850%**
Program Average Total Enrolled
416.000
Program Success Rate
66.970
- **25-39: 4313 - 75.310%**
Program Average Total Enrolled
154.000
Program Success Rate
69.880

- **40 & Over: 1929 - 78.380%**

Program Average Total Enrolled

24.000

Program Success Rate

73.240

- **Unknown: 11 - 65.690%**

Program Average Total Enrolled

1.000

Program Success Rate

50.000

- **a. With respect to disaggregated success rates, list any equity gaps that are identified and discuss interventions your program will implement to address these equity gaps? Please include a timeline of implementation and reassessment.**

An examination of the disaggregated success rates revealed that the majority of the biology department's disaggregated success rates were lower or very similar to our campus success rates. Student groups that appear to reveal the most significant equity gaps include the following: Asian students (-4.35%, n=281), Hawaiian/Pacific Islander students (-9%, n=3), and Latinx students (-6.02%, n=216). Both female (-5.87%, n=407) and male students (-2.13, n=192), and older students also had lower success rates compared to the campus. The success rates of students aged 25-39 and students 40 & Over were -5.44% (n=154) and -5.15% (n=24) lower, respectively, compared to the campus. Recent strategies that have been implemented by some of the courses in the department since the Spring 2023 semester include video-based student discussions, video-based instructor feedback, and discussions framed by the Practical Inquiry Model. These strategies have also been shown in the literature to improve student success rates for underrepresented students in STEM. Additionally, the BIOL072 Human Physiology course was recently revised in fall 2023 to incorporate a case study discussion session to allow students to practice and apply their learning from the course lectures and labs. We will reassess the effectiveness of these learning strategies in closing the equity gaps described above within 2 years (Fall 2025).

- **b. With respect to disaggregated success rates (ethnicity / race, gender and age), discuss student performance in reaching your program set standard for student success as well as reaching the program success goal.**

Most of our Health Science program's disaggregated success rates are much higher (ranging from +0.68% for our Black or African American students to +22.81% for students aged 17 & under) than our program set standard of 61.34%. Student groups with success rates that are lower than the program set standard for Biology include the following: Hawaiian/Pacific Islander students (-7.37%, n=3), and Latinx students (-2.47%, n=216). These lower values reflect the current literature on underrepresented students' success rates in STEM, which we hope to address with the new course and strategies described in the previous section.

As our program success goal of 71% is higher (+9.66%) than our program set standard, this means the success rates of the student groups described above are even lower when compared to our program success goal: Hawaiian/Pacific Islander students (-17.03%, n=3), and Latinx students

(-12.13%, n=216). The higher percentage of the program success goal also reveals significant student performance differences in two additional groups. Black or African American students are performing at a 8.98% lower success rate, and students between the ages of 18-24 are performing at a 4.03% lower success rate.

- **c. If your program offers course sections fully online, please contact the office of Research, Planning and Institutional Effectiveness to obtain a student success report on the online sections. Address any differences in student success rates between fully online courses and classroom courses.**

The Health Sciences Program does not offer fully online courses due to the in-person laboratory requirements for transfer. However, we do offer hybrid courses within this program, where lectures are online (asynchronous) and laboratory sessions are conducted in-person. Based on the recommendation from the IEC to compare these two modalities, we offer the analysis below:

Average rates from 2016-2022	Hybrid biology courses	Face-to-face biology courses
Completion rate	77.59%	81.61%
Success rate	67.24%	73.00%

Based on the findings above, our hybrid biology courses have lower average completion and success rates compared to our face-to-face courses. However, based on the current limitations in CROA, data from only a single semester was available for the hybrid biology course column, whereas data from 2016-2022 was available for the face-to-face biology courses in the Health Sciences Program. Comparison of the single semester data is consistent with the averages above:

Average rates from Spring 2017	Hybrid biology courses	Face-to-face biology courses
Completion rate	77.59%	87.93%
Success rate	67.24%	77.59%

These findings support the current educational literature regarding online learning, which suggests that success rates tend to be higher in face-to-face courses. However, since only data from a single semester for the hybrid courses were available, further analysis is needed. We plan to analyze the data again once more information is available on CROA.

Program Awards - If Applicable

If the classes in your program lead to a degree or certificate, please visit the DataMart and indicate how many degrees/certificates were awarded in your program:

**http://datamart.cccco.edu/Outcomes/Program_Awards.aspx
(http://datamart.cccco.edu/Outcomes/Program_Awards.aspx)**

You will need to select drop down menus and then “select program type by major of study” (for example, select Legal for paralegal studies).

Then at the bottom of the report, select the box “program type- four digits TOP”, then update report to get program specific information.

Degree Type

- **AA**

Number of Awards (Examine 2018-19, 2019-20 data, 2020-21 data and 2021-22 data)

452

Discussion

The number of AA awards for this program in recent years is listed as follows:

2018-2019: 113 awards

2019-2020: 81 awards

2020-2021: 132 awards

2021-2022: 126 awards

The total awards between 2018 and 2022 is 452.

Student Enrollment Types

Student Enrollment Type: Day or Evening Student

- **Day: 4505 - 50.500%**

Program Average Headcount

290.000

Program Percentage of Total

50.850

- **Day & Evening: 2656 - 29.800%**

Program Average Headcount

241.000

Program Percentage of Total

41.450

- **Evening: 951 - 10.700%**

Program Average Headcount

44.000

Program Percentage of Total

7.700

- **Unknown: 807 - 9.000%**

Program Average Headcount

Program Percentage of Total

Student Enrollment Type: Academic Load

- **Full Time: 2919 - 32.700%**

Program Average Headcount

228.000

Program Percentage of Total

39.570

- **Half Time or less than half time: 5843 - 65.500%**

Program Average Headcount

172.000

Program Percentage of Total

29.820

- **a. Discuss any changes in program enrollment types (day vs evening, full-time vs part-time) since your last program review?**

It is difficult to make a direct comparison as the last program review did not disaggregate the data between the various biology degrees (Biology AS-T, Biology AA, General Studies with an emphasis in Health Science, and Natural Science). Across all biology degrees, since our last program review, we have served significantly more daytime students (an average of 390 students F11-F16 compared to an average of 590 students F16-F22) and a slight decrease in day & evening (434 students F11-F16 compared to 402 students F16-F22) and evening students (41.2 F11-F16 compared to 57 students F16-F22). Overall, the biology program serves more daytime students and fewer evening students compared to the rest of EVC. This holds true for the Health Science degree program which also serves predominantly day students (50.85%), followed by day and evening students (41.45%).

- **b. Discuss how do your program enrollments (Pct of total) compare to EVC?**

During the last program review, the biology department had an average headcount of 400.9 (46.3%) full time students and 229.7 (26.5%) half time or less students. Since then, we have served approximately the same total number of full-time students (438) despite the growth of our program, meaning the overall percentage of full-time students has decreased (44.3%). On the other hand, we have significantly more half time or less than half time students (534 on average, 54.1%). While the Biology Majors skew heavily towards full-time enrollment, the Health Sciences program more closely mirrors that of the wider EVC campus both in terms of full-time students (Health Sciences = 39.57% vs. 32.7% EVC-wide), and a similar percentage of half-time or less than half time students (Health Sciences = 29.82% while EVC = 32.78%). This means that compared to our Biology Majors, our Health Science Majors are less likely to be full-time students.

- **c. Based on the data, would you recommend any changes?**

The reduced number of full-time enrollments in the Health Sciences compared to that of the Biology Majors suggests that our Health Science students are more likely to be working full or part-time jobs and/or caring for dependents (such as children, family members, etc.). To better support our student parents, EVC should invest in bringing back a childcare program to allow students with young children to attend classes and access campus services (such as tutoring, special events, participate in student clubs, etc.), and invest in more online or hybrid classes that better work around a busy work schedule. The pandemic, combined with the loss of the biology lecture halls brought about changes in many of our biology class structures. Currently, many of our laboratory classes are now offered in a hybrid

modality – online lectures combined with in-person labs. With this reduction in on-campus lecture time, students may be able to better schedule these classes around their needs to attend to their work and family.

Student Demographics - Headcount

Student Demographic: Gender

- **Female: 4914 - 55.170%**
Program Headcount
388.000
Program Percentage of Total
67.430
- **Male: 3965 - 44.400%**
Program Headcount
185.000
Program Percentage of Total
32.270
- **No Value Entered: 38 - 0.430%**
Program Headcount
2.000
Program Percentage of Total
0.320

Student Demographic: Age

- **17 & Below: 517 - 5.810%**
Program Headcount
6.000
Program Percentage of Total
1.140
- **18-24: 5364 - 60.090%**
Program Headcount
398.000
Program Percentage of Total
69.220
- **25-39: 2101 - 23.600%**
Program Headcount
148.000
Program Percentage of Total
25.640

- **40 & Over: 931 - 10.440%**
Program Headcount
23.000
Program Percentage of Total
3.980
- **Unknown: 6 - 0.060%**
Program Headcount
1.000
Program Percentage of Total
0.170

Student Demographic: Race/Ethnicity (IPEDs Classification)

- **American Indian: 35 - 0.390%**
Program Headcount
2.000
Program Percentage of Total
0.420
- **Asian: 3634 - 40.800%**
Program Headcount
268.000
Program Percentage of Total
46.500
- **Black or African American: 205 - 2.310%**
Program Headcount
11.000
Program Percentage of Total
2.030
- **Hawaiian/Pacific Islander: 33 - 0.360%**
Program Headcount
3.000
Program Percentage of Total
0.500
- **Latinx: 3608 - 40.490%**
Program Headcount
208.000
Program Percentage of Total
36.240
- **Two or More Races: 248 - 2.800%**
Program Headcount

20.000

Program Percentage of Total

3.480

- **Unknown: 598 - 6.590%**

Program Headcount

28.000

Program Percentage of Total

4.860

- **White: 556 - 6.260%**

Program Headcount

36.000

Program Percentage of Total

6.100

- **a. Based on the program total headcount and percent change year to year, discuss if your program growing or declining. If so, what do you attribute these changes in enrollment to and what changes will the program implement to address them?**

This is the first program review for the Associate in Arts Degree program in General Studies with Emphasis in Health Science. The data above is based on student enrollment in Microbiology, Anatomy, Chemistry and Physiology.

Enrollment in the program has been fluctuating from Spring 2017 to Spring 2020 with the highest headcount in Fall 2019 (+ 8.87%) and the lowest in Fall 2019 (-6.69%).

Enrollment started to decline as of Fall 2020 and it has continued to consistently drop every semester up until Spring 2022. The greatest decline in enrollment occurred in Spring 2022 (-16.96%). The lowest enrollment of Spring 2022 coincides with both Biology and Chemistry departments offering fully on- campus labs. In Fall 2021, both departments had piloted hybrid labs, with 50% of the lab sessions taking place in-person at 50% capacity and 50% of the lab sessions taking place online (through simulations). Even this hybrid model coincided with a drop in enrollment of -7.8%. This decrease may be attributed to confusion and uncertainties for students who had become accustomed to online teaching and online exams, as had been the practice of the Biology and Chemistry Departments during COVID-19 lockdown.

The decreased enrollment in the Health Science program is consistent with decreased enrollment in both of the Biology and Natural Science programs as well as an overall decreased enrollment at the college, which may be attributed to the disruptive impact of the Covid-19 pandemic.

As of Fall 2022, the Health Science program has experienced a 5.5% increase in enrollment, indicating recovery and growth.

Increased visibility and outreach events, efforts in community-building, and organizing structured biology-related gatherings for students could improve enrollment for underrepresented populations.

The main challenge in closing the identified gaps remains the lack of a building devoted to the biological sciences, and lack of funding for expansion.

- **b. Discuss any gaps have you identified in your program. Discuss how your program enrollment is similar or different from the campus. Discuss which gender, age, and/or ethnic group are proportionally smaller than campus make up.**

At 67.43% female students make up the majority of students enrolled in the Health Science program as well as of the campus more generally (55.16%). Most students in the program are ages 18-24 (69.22%), as is the case for the campus overall (60.11%). Asian students make up more than 46% of the enrollment in the Health Science program, compared to 40.79% for the campus. However, the percentage of Latinx (36.24%) students enrolled in the program is lower than the percentage enrolled at EVC overall (40.50%).

The American Indian (0.42%), African American (2.03%), Hawaiian/Pacific Islander (0.50%) and white student (6.10%) population headcounts in the Health Science program are significantly lower than the Asian (46.50%) and Latinx (36.24%) student populations, which is consistent with overall EVC enrollment rates.

- **c. Discuss what interventions the program can implement to address any gaps in enrollment.**

As indicated in Section (b), enrollment in the Health Science program among Latinx students has been lower than that of enrollment at the college overall, and it needs to be improved. Additionally, while enrollment rates of other diverse groups in the program are comparable to those of the college overall, such enrollment needs to grow. Furthermore, there is a gap between the female and male student populations enrolled in both the Health Science program and at the college overall, and the disparity should be addressed.

These identified gaps may be due to insufficient outreach from EVC to encourage Latinx, Black or African American, American Indian, Hawaiian/Pacific Islander and white student population to enroll in biology courses and pursue careers in biology or health science. The gap may be ameliorated through greater outreach to prospective students from local high schools. One measure may be to invest in communications with local high school counselors to ensure that students who may be interested in biology, and more specifically in health field at EVC, have the tools they need to feel empowered to pursue their academic goals and are receiving adequate information regarding pre-requisite courses offered at the high school level.

To address the gaps in the enrollment, the department will continue to organize outreach events and pursue community-building. As of Spring 2023, the faculty members have formed a biology club to attract current and future students to the program. Both chemistry and biology faculty members have organized events where students present posters on their scientific research. Additionally, in effort to increase awareness on campus of diverse scientists representing our diverse student population, Azita Tavana has compiled and drafted biographical information on several diverse scientists that have been displayed on plasma screens in the MS3 building and flyers posted in Sequoia.

However, the main challenge in closing the identified gaps remains the lack of a building devoted to the biological sciences, and the lack of funding for maintenance and expansion.

Program growth, visibility and maintenance require physical space and funding. A building to hold biology-related outreach events and gatherings, such as a speaker series featuring presentations from practitioners in biology-related fields, will introduce students to diverse areas in these fields and potentially attract many future students. The department can invite speakers from diverse backgrounds to encourage students of diverse backgrounds to pursue careers in biology or health

science. A student center within a Biological Sciences building would be a hub for biology students. Those with common interests and career goals in the field could interact, exchange ideas, and build community. Increased interest in various areas within biology would translate into increased enrollment at the college.

Additional funding is required to remodel the EVC Natural Science Museum and allow space for expansion.

Institutional Effectiveness (6.5 year average)

EVC Capacity: 61.69% EVC Productivity: 14.27

Program Capacity

75.85

Program Productivity

16.11

Is your capacity rate higher or lower then the campus?

Our average capacity rate is 14.16% higher than the campus.

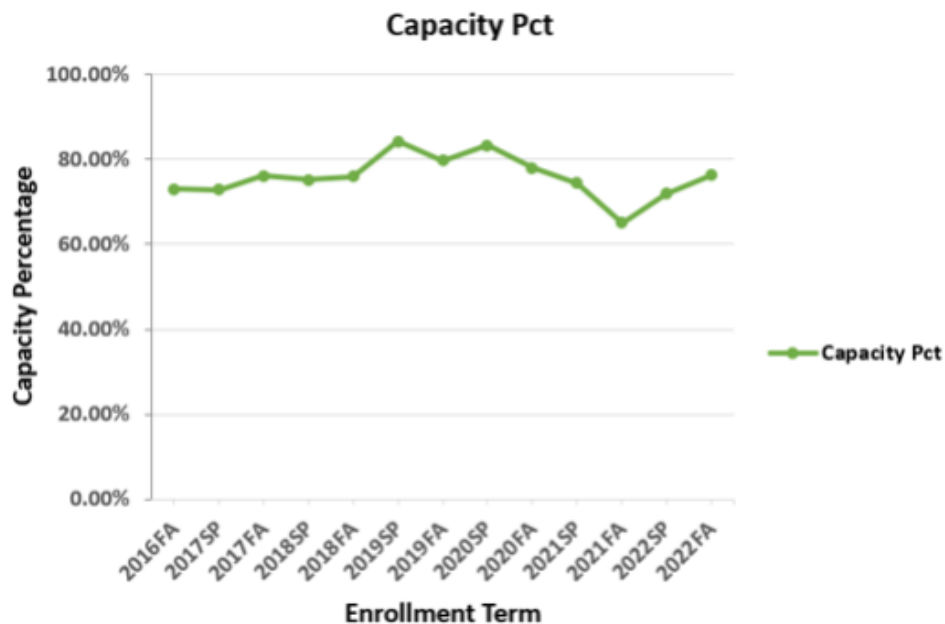
Is your productivity goal higher or lower than the campus?

Our average productivity goal is 1.84 points higher than the campus.

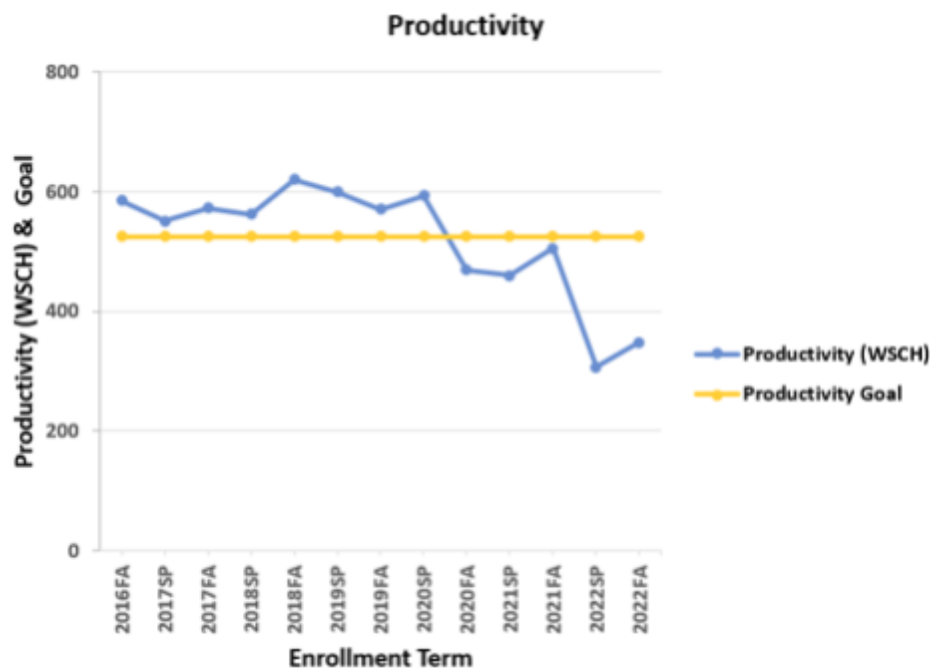
If the program capacity and/or productivity is lower than the campus, please provide rationale

Our average program capacity and productivity are both higher than the campus values (2016 – 2022):

- Capacity percentage at census date in the past 5 years (2016 – 2022):



- Program productivity vs EVC goal for the past 5 years (2016 – 2022):



Curriculum

Related Assessments

BIOL-071 Spring 2023 SLO Assessment- Created: 09/12/2023 New Section Level SLO Assessment Report Originator: Jennifer Kurushima (/Form/Module/Index/3804)

AA Gen Studies Health Science 2023- Created: 09/15/2023 New PLO Assessment Report Originator: Lisa Hays (/Form/Module/Index/3861)

BIOL 072 Human Physiology Lecture in Person- Created: 09/13/2023 New Section Level SLO Assessment Report Originator: Lisa Pang (/Form/Module/Index/3835)

BIOL 072 Human Physiology Lecture Asynch- Created: 09/13/2023 New Section Level SLO Assessment Report Originator: Lisa Pang (/Form/Module/Index/3836)

Biol 074 Summer 2023- Created: 09/14/2023 New Section Level SLO Assessment Report Originator: Azita Tavana (/Form/Module/Index/3846)

CHEM 015 SP 2021- Created: 01/12/2022 New Section Level SLO Assessment Report Originator: Michael Ghebreab (/Form/Module/Index/2128)

CHEM 015 FA 2021- Created: 01/28/2022 New Section Level SLO Assessment Report Originator: Michael Ghebreab (/Form/Module/Index/2192)

CHEM 015 FA 2023- Created: 03/15/2024 New Section Level SLO Assessment Report Originator: Michael Ghebreab (/Form/Module/Index/5412)

CHEM 015 SP 2021- Created: 01/12/2022 New Section Level SLO Assessment Report Originator: Michael Ghebreab (/Form/Module/Index/2127)

CHEM 030A- Created: 03/01/2024 New Section Level SLO Assessment Report Originator: Charles Chau (/Form/Module/Index/5348)

Courses in the program

BIOL 071 - Human Anatomy - Active. Implemented on Sep 27 2022 12:00AM (/Form/Course/index/4834)

BIOL 072 - Human Physiology - Active. Implemented on Mar 21 2023 12:00AM (/Form/Course/index/4825)

BIOL 074 - General Microbiology - Active. Implemented on Sep 27 2022 12:00AM (/Form/Course/index/4849)

CHEM 015 - Fundamentals of Chemistry - Active. Implemented on Feb 3 2021 12:00AM (/Form/Course/index/3986)

CHEM 030A - Introduction to Chemistry - Active. Implemented on Feb 27 2023 12:00AM
(/Form/Course/index/5182)

- 1. Identify and updates to curriculum since the last comprehensive program review, including and new programs and indicate the 6-year timeline for scheduled course outline revision. For CTE, the time line is 2 year.

In the table below (Table B.1.a) are identified all the courses offered by the Biology Department. The data are currently found in the EVC CurriQunet curriculum database. This is a new program review. Courses with "Need..." in the "next review date" column are awaiting the last step of approval for implementation. Please note that the next review date is approximately two years in the future, to take into account the time needed for departmental review of the course outlines and to allow for the course outlines to move through the curriculum process. The impending implementation of scheduling courses for the entire academic year necessitates shortening the time between revisions to ensure the courses offered are continuously up-to-date.

Table B.1a. List of active courses offered by the Biology Department

Course Number	Course Title	Last Revision Date/ Implement Date	Next Review Date
BIOL 004A	General Principles and Cell Biology	05/26/2023	2024-25
BIOL 004B	Organismal Biology and Biodiversity	05/26/2023	2024-25
BIOL 014	Head Smart into the Sciences	01/28/2022	2024-25
BIOL 020	Human Biology	10/19/2021	2024-25
BIOL 021	General Biology	09/27/2021	2024-25
BIOL 061	Human Heredity	03/16/2023	2024-25
BIOL 062	Plants and Human Welfare	02/23/2023	2024-25
BIOL 063	Ecology: Connections of Life, Environment and Humans	03/10/2023	Need draft implement
BIOL 064	Marine Biology	02/28/2023	2024-25
BIOL 065	Wildlife Biology	03/16/2023	2024-25
BIOL 071	Human Anatomy	09/27/2022	2024-25
BIOL 072	Human Physiology	03/21/2023	2024-25
BIOL 074	General Microbiology	09/27/2022	2024-25
BIOL 080A	Field Biology – Canyons and Cliffs	05/16/2023	Need draft implement
BIOL 080B	Field Biology – Birds and Blooms	10/12/2023	Need VP approval
BIOL 080C	Field Biology – Coastal California	09/25/2023	2024-25
BIOL 080D	Field Biology – Desert and Dunes	09/25/2023	2024-25

BIOL 080E	Field Biology – Mountains	05/16/2023	Need draft implement
BIOL 080F	Field Biology – Forest and River Ecology	09/26/2023	2024-25
BIOL 080G	Field Biology – Volcanoes of California	03/10/2023	Need draft implement
BIOL 098	Directed Study in Biology	09/27/2023	2024-25
ENVIR 010	Environmental Science	01/11/2021	2024-25
OCEAN 010	Descriptive Oceanography	02/23/2023	2024-25

Compiled by Lisa Pang on 10/15/2023

The following table (Table B.1b) identifies the programs associated with the Biology Department. The data are currently found in the EVC CurriQunet curriculum database.

Please note that the next review date is approximately two years in the future, to take into account the time needed departmental review of the program outlines and to allow for the program outlines to move through the curriculum process. The impending implementation of scheduling courses for the entire academic year necessitates shortening the time between revisions to ensure the programs offered are continuously up-to-date.

Table B.1b. Degree programs offered by the Biology Department

Degree Program	Program Title	Last Revision Date/ Implement Date	Next Review Date
AA	Biology	Implemented 06/22/2022 (State control number 18991)	Fall 2024
AA	General Studies with Emphasis in Health Science	Implemented 06/22/2022 (State control number 18693)	Fall 2024
AA	General Studies with Emphasis in Natural Science	Implemented 06/22/2022 (State control number 18695)	Fall 2024
AS-T	Biology	Implemented 02/01/2023 (State control number 35478)	Spring 2025

Compiled by Lisa Pang on 10/15/2023

- 2. Identify all the courses offered in the program and describe how these courses remain relevant in the discipline. For courses your program has not offered in the past two years, please discuss a plan on how to deal with these courses (if your program is not going to deactivate these courses, please explain why).**

Table B.2a. Courses offered by the Biology Department with descriptions of relevancy

Course Number	Course Title	Relevancy in the discipline and real life experiences
BIOL 004A	General Principles and Cell Biology	Part of TMC in AS-T Biology degree
BIOL 004B	Organismal Biology and Biodiversity	Part of TMC in AS-T Biology degree
BIOL 014	Head Smart Into the Sciences	AA/AS applicable; transfers to CSU and UC
BIOL 020	Human Biology	Fulfills requirement for GE science with lab (life science)
BIOL 021	General Biology	Fulfills requirement for GE science with lab (life science); prerequisite course for BIOL 071
BIOL 061	Human Heredity	Fulfills requirement for GE science (life science)
BIOL 062	Plants and Human Welfare	Fulfills requirement for GE science (life science)
BIOL 063	Ecology	Fulfills requirement for GE science (life science)
BIOL 064	Marine Biology	Fulfills requirement for GE science with lab (life science)
BIOL 065	Wildlife Biology	Fulfills requirement for GE science (life sci)
BIOL 071	Human Anatomy	Prerequisite course for BIOL 072; required prep course for most allied health majors; fulfills requirement for GE science with lab (life science)
BIOL 072	Human Physiology	Required prep course for most allied health majors; fulfills requirement for GE science with lab (life science)
BIOL 074	General Microbiology	Required prep course for most allied health majors; fulfills requirement for GE science with lab (life science)
BIOL 080A	Field Biology – Canyons and Cliffs	AA/AS applicable; transfers to CSU and UC
BIOL 080B	Field Biology – Birds and Blooms	AA/AS applicable; transfers to CSU and UC
BIOL 080C	Field Biology – Coastal California	AA/AS applicable; transfers to CSU and UC
BIOL 080D	Field Biology – Death Valley National Park	AA/AS applicable; transfers to CSU and UC
BIOL 080E	Field Biology – Mountains	AA/AS applicable; transfers to CSU and UC
BIOL 080F	Field Biology – Forest and River Ecology	AA/AS applicable; transfers to CSU and UC
BIOL 080G	Field Biology – Volcanic Northern California	AA/AS applicable; transfers to CSU and UC

BIOL 098	Directed Study in Biology	AA/AS applicable; transfers to CSU and UC
ENVIR 010	Environmental Science	Fulfills requirement for GE science with lab (life science or physical science)
OCEAN 010	Descriptive Oceanography	Fulfills requirement for GE science (life science or physical science)

Compiled by Darcy Ernst on 10/18/2023

The next table (Table B.2b) summarizes the frequency and time of course offerings by semester (fall, spring, summer) and time of day (day, evening, weekend).

Table B.2b. Frequency and time of course offerings

Course Number	Course Title	Frequency of Offering	Time of Offering
BIOL 004A	General Principles and Cell Biology	Fall, spring	Day
BIOL 004B	Organismal Biology and Biodiversity	Fall, spring	Day
BIOL 014	Head Smart Into the Sciences	Fall, spring	Day
BIOL 020	Human Biology	Fall, spring	Day, evening
BIOL 021	General Biology	Summer, fall, spring	Day, evening
BIOL 061	Human Heredity	Summer, fall, spring	Online
BIOL 062	Plants and Human Welfare	Summer, fall, spring	Day, evening
BIOL 063	Ecology	Summer, fall, spring	Online
BIOL 064	Marine Biology	Fall, spring	Day
BIOL 065	Wildlife Biology	Summer, fall, spring	Online
BIOL 071	Human Anatomy	Summer, fall, spring	Day, evening
BIOL 072	Human Physiology	Summer, fall, spring	Day, evening
BIOL 074	General Microbiology	Summer, fall, spring	Day, evening

BIOL 080A	Field Biology – Canyons and Cliffs	Spring	Day, evening, weekend
BIOL 080B	Field Biology – Birds and Blooms	Spring	Day, evening, weekend
BIOL 080C	Field Biology – Coastal California	Fall	Day, evening, weekend
BIOL 080D	Field Biology – Death Valley National Park	Interession	Day, evening, weekend
BIOL 080E	Field Biology – Mountains	Summer	Day, evening, weekend
BIOL 080F	Field Biology – Forest and River Ecology	Spring	Day, evening, weekend
BIOL 080G	Field Biology – Volcanic Northern California	Summer	Day, evening, weekend
BIOL 098	Directed Study in Biology	Fall, spring	Day
ENVIR 010	Environmental Science	Summer, fall, spring	Online
OCEAN 010	Descriptive Oceanography	Summer, fall, spring	Online

Compiled by Darcy Ernst on 10/18/2023

BIOL 080A, 080B, 080E, and BIOL 098 are new curriculum, either waiting for implementation (Bio 80s) or will be offered starting Spring 2024 (BIOL 098).

- **3. If you have a degree or certificate, please include a diagram of your program's guided pathways program map. (A program map indicates courses suggested for each semester, across two years, upon completion a student would qualify for a degree/certificate).**

Table B.3a AA General Studies with an Emphasis in Health Science (60.0 Units)

Fall Term 1	Spring Term 2	Fall Term 3	Spring Term 4
Chem 15	Bio 71	Bio 72	Bio 74
Bio 20 or 21	Area B4	Area C2	Area C
Eng 1A	Area F	US History	US History
Area C1	Area A1	Area A3	Area E
	Physical Activity	AA Applicable elective	AA Applicable elective

- **4. Identify and describe innovative strategies or pedagogy your department/program developed/offered to maximize student learning and success. How did they impact student learning and success?**

Over the past few years biology faculty have been curating, implementing, and creating open educational resources (OER) for use in our courses. Overall, the goal is to give students free, high quality resources for use in their courses. Reducing financial barriers for students improves student learning and success; they can spend less time working outside the classroom to pay for classroom materials, thus spending more time on their studies, and free materials reduces student withdrawal from courses, improving student success.

Several courses in biology have adopted existing OER resources (Biol 20, Biol 21, Biol 4A, Biol 4B), several other courses have faculty that have created free materials for students (Biol 71, Biol 20, Biol 21), and several faculty applications for creation of OER have been funded by the office of the president over the last two years. Two OER resources (a lab manual and instructor resource guide) were written for Biol 4A and 4B by May Chen, Darcy Ernst, Katie Foltz, and Bridget Greuel. Bio 4A and 4B can be used as a pre-requisite series for the health science major.

Adam Green created the Biol 21 lab manual in 2023. It includes canvas page background material, worksheets, and question banks. This made the lab manual free for all students in BIOL 21. This also allows us to highlight local ecology and the resources we have available in our department. Having control over the lab manual will also allow us to fine tune and update the material to better fit our course. This is the first semester the new manual has been adopted and we are continuing to troubleshoot the lab exercises. The savings to students is immediate, but the impact on student learning is not yet clear. The benefit of having our own manual is that if any lab exercise is not meeting the outcomes we hoped for, then we can make the changes ourselves and incorporate them quickly.

In Biol 4B, Darcy Ernst has implemented a Course-Based Undergraduate Research Experience (CURE), culminating in a student research symposium at the end of each semester. This CURE and presentation give all students authentic and professional research and presentation experiences, which greatly increase student learning and success. Students see themselves as scientists and take ownership of their own projects, increasing student investment in the classroom and attainment of real-world skills. In 2023, Darcy Ernst was granted Student Equity Program and Basic Needs funding to expand the student research symposium to the entire MSE division with the goal of supporting student equity, particularly for economically disadvantaged students.

The curriculum for BIOL-020 (Human Biology) was updated in 2021 to reflect the current approach to human biology – reducing the focus on pure anatomy and physiology, and emphasizing human evolution, population growth, the role humans play in the environment and human effects on climate change. At this point, the biology faculty transitioned the class from a traditional textbook to an OER (OpenStax). Additionally, Jennifer Kurushima wrote an in-house lab manual consisting of a series of handouts. These handouts are provided to students for free. This reduced the cost of the course materials from \$200 (for the lecture and lab texts) to zero. The lab handouts improved upon the lab activities in the prior iteration of the course by incorporating more hands-on activities, student designed experiments, and opportunities for students to interact with each other, thus promoting community building in the classroom. This class is now accepted as a pre-requisite for BIOL-071 (Human Anatomy), giving our pre-health students an alternative pathway into the health science course series.

For BIOL 071, there was a complete overhaul of the laboratory portion of the course since the last program review. Previously, labs and homework were mainly focused on completing diagrams of tissues/organs to turn in for points. The lab manual was a checklist of structures that students had to learn from the models, specimens, etc. The lab now uses handouts written by Jennifer Kurushima which ask the students to perform a variety of tasks from labeling diagrams, models, drawing histology, and other hands-on activities. These are turned in at the end of each lab and the instructor can provide feedback to the students on their comprehension. There is also the incorporation of weekly/semiweekly assessments to provide students with examples of lab practical questions. The lecture portion of the course was also modified, most noticeably with the increase in number of homework assignments which provides formative assessments and the addition of Scientist Spotlights. Scientist Spotlight assignments allow students to connect with the scientific field by introducing them to scientific leaders who are not the typical representation of scientists shown in most scientific textbooks. Students frequently comment that they go through the same struggles these scientists face. Students benefitted immensely from these changes. Previously, 50% of the class from census remained enrolled by the end of the semester, now 75-90% of the class completes the course.

Adam Green is developing a new department website that will provide more detail on our courses, faculty, staff, opportunities, and events. This online presence will improve the navigation of Biology and hopefully attract students to the program and course offerings. This website can also be linked to Guided Pathways and to the online course descriptions adding detail for students.

May Chen led a research study in the spring of 2023. Biology students participated in a research study designed to evaluate the effectiveness of learning activities designed to increase student interaction and collaboration with both their peers and their instructors in online and hybrid biology courses. These activities included video-based student discussions, video-based instructor feedback, and a text-based discussion framed by the practical inquiry model. Four instructors implemented the learning activities across four fully online and hybrid courses and over 80 students. Quantitative and qualitative data collected from 26 student survey and interview participants were encouraging and suggested that the implementation of these activities promoted student perceptions of social, cognitive, and teaching presence and also positively influenced student perceptions of classroom community. These learning strategies continue to be implemented in several courses across the department to promote student success on our online and hybrid courses.

Darcy Ernst, Lisa Hays, and Jennifer Kurushima developed a new course, Biol 14: Head Smart into the Sciences. This course is a biology careers course, exposing students to the hidden curriculum required for success in STEM fields and helping them explore biology career options. This innovative course teaches soft skills and transferrable skills, such that students are more prepared for success in their STEM courses and ultimately supporting student degree attainment, transfer, and career placement. It was offered for the first time in the fall of 2022 and enrollment has increased each semester since.

- **5. Discuss plans for future curricular development and/or program degrees & certificates included) modification.**

The biology department is interested in developing two certificates and a skills competency designation in the future:

1. Field Biology Technician Certificate:

Wildlife Biology, Ecology, Marine Biology lecture/lab courses

Biology 80 series as field experience

Independent study- research experience

2. Environmental Science Technician Certificate:

Wildlife Biology, Ecology, Marine Biology, Enviro lecture/lab courses

Biology 80 series

Independent study- environmental science-based research

3. Skills competency transcript designation for students completing BIOL 80 courses.

• **6. Describe how your program is articulated with High School Districts, and/or other four year institutions. (Include articulation agreements, CID, ADTs...)**

The courses offered by the Biology Department are not currently articulated with high school districts within the SJECCD service area, other than by its policy regarding awarding college credit based on Advanced Placement (AP) test scores (pages 19-20 in the current college catalog).

BIOL 071 will accept AP Biology Exam with a 3, 4, or 5.

Many courses offered by the Biology Department are transferable to both CSU and UC, as shown in the table (Table B.6a) below. One course does not have IGETC transfer status— BIOL 014, while the remaining eight courses do not have either CSU or IGETC status – BIOL 080A-G and BIOL 098 (refer to ASSIST.org)

Table B.6a. Biology courses transferable to CSU and UC campuses

Course Number	CSU GE Areas	IGETC Areas
BIOL 004A	B2 (life science), B3 (lab activity)	5B (biological science), 5C (science lab)
BIOL 004B	B2, B3	5B, 5C
BIOL 014	E (lifelong understanding and self-development)	None
BIOL 020	B2, B3	5B, 5C
BIOL 021	B2, B3	5B, 5C
BIOL 061	B2	5B
BIOL 062	B2	5B
BIOL 063	B2	5B

BIOL 064	B2, B3	5B, 5C
BIOL 065	B2	5B
BIOL 071	B2, B3	5B, 5C
BIOL 072	B2, B3	5B, 5C
BIOL 074	B2, B3	5B, 5C
ENVIR 010	B1 (physical science), B2, B3	5A (physical science), 5B, 5C
OCEAN 010	B1	5A

Compiled by Lisa Pang 10/15/2023

The Biology Department currently has four courses with C-ID approval. These courses are found in the table (Table B.6b) below. The courses were revised to match the C-ID course descriptors when they were last updated.

Table B.6b. Biology Department active courses with C-ID numbers

C-ID Course	Descriptor Title	EVC Course	Course Title
BIOL 110B	Human Anatomy with Lab	BIOL – 071	Human Anatomy
BIOL 120B	Human Physiology with Lab	BIOL – 072	Human Physiology
BIOL 135S	Biology Sequence for Majors	BIOL – 004A	General Principles and Cell Biology
		BIOL – 004B	Organismal Biology and Biodiversity
BIOL 140	Organismal Biology	BIOL – 004B	Organismal Biology and Biodiversity
BIOL 190	Cell and Molecular Biology	BIOL – 004A	General Principles and Cell Biology

Compiled by Lisa Pang 10/15/2023

- **7. If external accreditation or certification is required, please state the certifying agency and status of the program.**

Our program does not require external accreditation or certification.

Student Learning Outcome and Assessment

Related Assessments

BIOL-071 Spring 2023 SLO Assessment- Created: 09/12/2023 New Section Level SLO Assessment Report Originator: Jennifer Kurushima (/Form/Module/Index/3804)

AA Gen Studies Health Science 2023- Created: 09/15/2023 New PLO Assessment Report Originator: Lisa Hays (/Form/Module/Index/3861)

BIOL 072 Human Physiology Lecture in Person- Created: 09/13/2023 New Section Level SLO Assessment Report Originator: Lisa Pang (/Form/Module/Index/3835)

BIOL 072 Human Physiology Lecture Asynch- Created: 09/13/2023 New Section Level SLO Assessment Report Originator: Lisa Pang (/Form/Module/Index/3836)

Biol 074 Summer 2023- Created: 09/14/2023 New Section Level SLO Assessment Report Originator: Azita Taviana (/Form/Module/Index/3846)

CHEM 015 SP 2021- Created: 01/12/2022 New Section Level SLO Assessment Report Originator: Michael Ghebreab (/Form/Module/Index/2128)

CHEM 015 FA 2021- Created: 01/28/2022 New Section Level SLO Assessment Report Originator: Michael Ghebreab (/Form/Module/Index/2192)

CHEM 015 FA 2023- Created: 03/15/2024 New Section Level SLO Assessment Report Originator: Michael Ghebreab (/Form/Module/Index/5412)

CHEM 015 SP 2021- Created: 01/12/2022 New Section Level SLO Assessment Report Originator: Michael Ghebreab (/Form/Module/Index/2127)

CHEM 030A- Created: 03/01/2024 New Section Level SLO Assessment Report Originator: Charles Chau (/Form/Module/Index/5348)

Student Learning Outcomes

BIOL 071 - Human Anatomy - Use correct anatomical terminology in identifying and describing body structures, body systems, and their functions at the gross and microscopic levels. (Active)

BIOL 071 - Human Anatomy - Identify and describe histological sections of selected body organs, including observable tissues, cells and structures. (Active)

BIOL 071 - Human Anatomy - Relate anatomical structures of the human body to their functions. (Active)

BIOL 071 - Human Anatomy - Analyze clinical data to distinguish normal versus abnormal (pathological) conditions. (Active)

BIOL 071 - Human Anatomy - Describe structural and anatomical changes that occur in disease, injury or aging of the human body systems. (Active)

BIOL 072 - Human Physiology - Explain the homeostatic mechanisms, controls, and specific functions of the systems of the human body and evaluate information concerning selected topics within this theme of homeostasis. (Active)

BIOL 072 - Human Physiology - Explain the homeostatic mechanisms, controls, and specific functions of the systems of the human body and evaluate information concerning selected topics within this theme of homeostasis. (Active)

BIOL 072 - Human Physiology - Design, construct, interpret and present physiological experiments and data. (Active)

BIOL 072 - Human Physiology - Design, construct, interpret and present physiological experiments and data. (Active)

BIOL 072 - Human Physiology - Analyze and explain medical and health science-related scenarios of physiological system disruptions. (Active)

BIOL 072 - Human Physiology - Analyze and explain medical and health science-related scenarios of physiological system disruptions. (Active)

BIOL 074 - General Microbiology - Categorize the diversity found within the microbial world and relationships between different microbes and their hosts, and describe the impacts of microbes in the environment. (Active)

BIOL 074 - General Microbiology - Describe the biochemical basis of microbial life and analyze laboratory experiments using biochemical concepts. (Active)

BIOL 074 - General Microbiology - Describe epidemiology and the disease process, and how the innate and adaptive immune systems provide protection against infection. (Active)

BIOL 074 - General Microbiology - Describe the relationship between microbial growth and the control of microbial growth, and apply this understanding to the prevention and control of infectious diseases and human welfare. (Active)

BIOL 074 - General Microbiology - Demonstrate proficiency with laboratory equipment, conduct laboratory experiments in a safe manner using aseptic technique, and interpret results and draw scientific conclusions from those results. (Active)

CHEM 015 - Fundamentals of Chemistry - Apply safety rules learned in lab to safely conduct lab operations and present laboratory data using graphing and precision of data with simple statistics. (Draft)

CHEM 015 - Fundamentals of Chemistry - Apply safety rules learned in lab to safely conduct lab operations and present laboratory data using graphing and precision of data with simple statistics. (Draft)

CHEM 015 - Fundamentals of Chemistry - Apply safety rules learned in lab to safely conduct lab operations and present laboratory data using graphing and precision of data with simple statistics. (Historical)

CHEM 015 - Fundamentals of Chemistry - Apply safety rules learned in lab to safely conduct lab operations and present laboratory data using graphing and precision of data with simple statistics. (Active)

CHEM 015 - Fundamentals of Chemistry - Distinguish between elements and compounds, their physical and chemical properties, along with ionic and covalent compounds and the writing of their names and formulas. (Active)

CHEM 015 - Fundamentals of Chemistry - Distinguish between elements and compounds, their physical and chemical properties, along with ionic and covalent compounds and the writing of their names and formulas. (Historical)

CHEM 015 - Fundamentals of Chemistry - Distinguish between elements and compounds, their physical and chemical properties, along with ionic and covalent compounds and the writing of their names and formulas. (Draft)

CHEM 015 - Fundamentals of Chemistry - Distinguish between elements and compounds, their physical and chemical properties, along with ionic and covalent compounds and the writing of their names and formulas. (Draft)

CHEM 015 - Fundamentals of Chemistry - Describe the internal structure of atoms using subatomic particles; the meaning of nuclear symbols for isotopes while predicting the nature of chemical bonds and molecular polarity from the periodicity of the elements. (Draft)

CHEM 015 - Fundamentals of Chemistry - Describe the internal structure of atoms using subatomic particles; the meaning of nuclear symbols for isotopes while predicting the nature of chemical bonds and molecular polarity from the periodicity of the elements. (Draft)

CHEM 015 - Fundamentals of Chemistry - Describe the internal structure of atoms using subatomic particles; the meaning of nuclear symbols for isotopes while predicting the nature of chemical bonds and molecular polarity from the periodicity of the elements. (Historical)

CHEM 015 - Fundamentals of Chemistry - Describe the internal structure of atoms using subatomic particles; the meaning of nuclear symbols for isotopes while predicting the nature of chemical bonds and molecular polarity from the periodicity of the elements. (Active)

CHEM 015 - Fundamentals of Chemistry - Explain the concepts of chemical stoichiometry at both the macroscopic and particulate level while applying these concepts to solving chemical reaction problems from real-world information and predicting products of simple chemical reaction types. (Active)

CHEM 015 - Fundamentals of Chemistry - Explain the concepts of chemical stoichiometry at both the macroscopic and particulate level while applying these concepts to solving chemical reaction problems from real-world information and predicting products of simple chemical reaction types. (Historical)

CHEM 015 - Fundamentals of Chemistry - Explain the concepts of chemical stoichiometry at both the macroscopic and particulate level while applying these concepts to solving chemical reaction problems from real-world information and predicting products of simple chemical reaction types. (Draft)

CHEM 015 - Fundamentals of Chemistry - Explain the concepts of chemical stoichiometry at both the macroscopic and particulate level while applying these concepts to solving chemical reaction problems from real-world information and predicting products of simple chemical reaction types. (Draft)

CHEM 015 - Fundamentals of Chemistry - Explain gas behavior using macroscopic properties and microscopic molecular dynamics and solve problems of gases using the combined gas law and ideal gas law. (Draft)

CHEM 015 - Fundamentals of Chemistry - Explain gas behavior using macroscopic properties and microscopic molecular dynamics and solve problems of gases using the combined gas law and ideal gas law.

(Draft)

CHEM 015 - Fundamentals of Chemistry - Explain gas behavior using macroscopic properties and microscopic molecular dynamics and solve problems of gases using the combined gas law and ideal gas law.

(Historical)

CHEM 015 - Fundamentals of Chemistry - Explain gas behavior using macroscopic properties and microscopic molecular dynamics and solve problems of gases using the combined gas law and ideal gas law.

(Active)

CHEM 015 - Fundamentals of Chemistry - Explain how liquids, solids and solution behavior can be understood using intermolecular dynamics and modified kinetic molecular theory, and solve solution concentration problems along with explaining acid-base reactions, electrolytic behavior, and performing pH and titration calculations. (Active)

CHEM 015 - Fundamentals of Chemistry - Explain how liquids, solids and solution behavior can be understood using intermolecular dynamics and modified kinetic molecular theory, and solve solution concentration problems along with explaining acid-base reactions, electrolytic behavior, and performing pH and titration calculations. (Historical)

CHEM 015 - Fundamentals of Chemistry - Explain how liquids, solids and solution behavior can be understood using intermolecular dynamics and modified kinetic molecular theory, and solve solution concentration problems along with explaining acid-base reactions, electrolytic behavior, and performing pH and titration calculations. (Draft)

CHEM 015 - Fundamentals of Chemistry - Explain how liquids, solids and solution behavior can be understood using intermolecular dynamics and modified kinetic molecular theory, and solve solution concentration problems along with explaining acid-base reactions, electrolytic behavior, and performing pH and titration calculations. (Draft)

CHEM 030A - Introduction to Chemistry - Express measurements using proper units and significant figures. (Active)

CHEM 030A - Introduction to Chemistry - Describe simple atomic structure, write the names and formulas of ionic and molecular compounds, simple acids, bases, and salts, and distinguish between compounds and mixtures. (Active)

CHEM 030A - Introduction to Chemistry - Predict chemical reactivity, bond types, and molecular polarity from the Periodic Table. (Active)

CHEM 030A - Introduction to Chemistry - Apply the concept of chemical stoichiometry, quantitatively determine the percent yield of a reaction, and solve real-world chemical problems. (Active)

CHEM 030A - Introduction to Chemistry - Solve gas law problems and use Kinetic Molecular Theory to explain how gases behave. (Active)

CHEM 030A - Introduction to Chemistry - Explain how liquids, solids, solutions, acids, and bases react and calculate the various types of solution concentrations including titration values for both lab and real-world situations. (Active)

Program Learning Outcomes

General Studies with Emphasis in Health Science - Associate in Arts: Associate in Arts - Employ the scientific method in the design, implementation, data collection, and analysis of experiments or observational studies. (Active)

General Studies with Emphasis in Health Science - Associate in Arts: Associate in Arts - Practice current or industry-standard laboratory techniques and lab safety procedures. (Active)

General Studies with Emphasis in Health Science - Associate in Arts: Associate in Arts - Explain scientific concepts and processes from levels ranging from biochemical to ecological. (Active)

- **1. On the program level, defined as a course of study leading to degree or certificate, list the Program Learning Outcomes (PLOs), and how they relate to the GE/ILOs. Please also indicate how the course SLOs have been mapped to the PLOs. If you are completing this program review as a department or discipline and do not offer any degrees or certificates, please write N/A in this space.**

General Studies with Emphasis in Health Science AA

PLO 1: Employ the scientific method in the design, implementation, data collection, and analysis of experiments or observational studies.

Mapped to the following ILO's:

- Inquiry and Reasoning: The student will critically evaluate information to interpret ideas and solve problems.
- Information Competency: The student will utilize information from a variety of sources and make an informed decision and take action.

SLO's mapped to this PLO:

- BIOL 071: Analyze clinical data to distinguish normal versus abnormal (pathological) conditions.
- The PLO is introduced, mastered and measured in the course.

PLO 2: Practice current or industry-standard laboratory techniques and lab safety procedures.

Mapped to the following ILO's:

- Communication: The student will demonstrate effective communication, appropriate to the audience and purpose.
- Inquiry and Reasoning: The student will critically evaluate information to interpret ideas and solve problems.
- Information Competency: The student will utilize information from a variety of sources and make an informed decision and take action.
- Personal Development: The student will demonstrate growth and self-management to promote life-long learning and personal well-being.

SLO's mapped to this PLO:

- BIOL 074: Demonstrate proficiency with laboratory equipment, conduct laboratory experiments in a safe manner using aseptic technique, and interpret results and draw scientific conclusions from those results.
- The PLO is introduced, developed and practiced in the course.
- CHEM 015: Apply safety rules learned in lab to safely conduct lab operations and present laboratory data using graphing and precision of data with simple statistics.
- The PLO is introduced, mastered and measured in the course.

PLO 3: Explain scientific concepts and processes from levels ranging from biochemical to ecological.

Mapped to the following ILO's:

- Communication: The student will demonstrate effective communication, appropriate to the audience and purpose.
- Inquiry and Reasoning: The student will critically evaluate information to interpret ideas and solve problems.

SLO's mapped to this PLO:

BIOL 072: Explain the homeostatic mechanisms, controls, and specific functions of the systems of the human body.

The PLO is introduced, developed and practiced in the course.

- **2. Since your last program review, summarize SLO assessment activities and results at the course and program level. Please include dialogue regarding SLO Assessment results with division/department/college colleagues and/or GE areas. Provide evidence of the dialogue (i.e. department meeting minutes or division meeting minutes, etc.) List any SLOs or PLOs that have not been assessed in the last two years and provide an explanation of why they have not been assessed. This will be reviewed by the IEC to determine if your Program Review is approved or not.**

The biology department completed all course SLO's and PLO's with the associated mapping to ILO's in Fall 2023. During Professional Development at the start of Fall 2023 the department met and planned out the SLO and PLO process with corresponding deadlines and task leads for the different courses and programs. The MSE division was the first division to complete all SLO, PLO, and ILO reporting.

SLO Updates were discussed during the following biology department meetings: 10-20-23, 9-15-23, 5-20-22, 3-18-22, 2-25-22, 11-19-21, 8-27-21, 3-19-21, 2-5-21, 1-22-21, 12-11-20, 10-23-20, 10-2-20.

- **3. What plans for improvement have been implemented to your courses or program as a result of SLO assessment? Please share one or two success stories about the impacts of SLO assessment on student learning.**

The latest SLO assessment for all biology courses was completed this fall semester (2023), so there has not been time to implement any changes because of these assessments.

Additionally, the biology department has hired several faculty members over the past five years and these new faculty bring new perspectives and are updating courses and their corresponding SLO's. This much needed reassessment means course design and SLO's in many of our courses are changing simultaneously making comparisons to past SLO results challenging.

What follows is a summary of some common themes in our SLO assessments and plans for improvement.

Content Mastery

Many of our courses and programs have SLO's and PLO's associated with content mastery. BIOL 21, the largest course in the biology department, serves as an example of this assessment and the resulting ideas for improvement.

Experience with students in class combined with SLO results made clear the lack of preparation most students have for college level science. The course has every component for student success, but students are not making the effort to view the lecture videos, read the text, or study on a regular basis.

In Fall '23, as part of the new lab manual, lab #1 addressed the scientific method by using research on student learning and different study techniques that are shown to work across disciplines. Students read and discussed the results of research that showed distributed studying and self-testing were two methods that showed consistent benefits while cramming, highlighting, and re-reading (more than 2 times) were ineffective and inefficient. They also analyzed a paper on the benefit of a learn, sleep, re-learn method for better and longer retention of material. Despite this lab and the clear results, students continue to falter and have not adopted the prescribed strategies. A post mid-term discussion assignment asked them to reflect on what worked and what didn't work for Exam 1. The students who responded indicated that cramming was unsuccessful and the techniques they learned about in lab 1 would likely have been better strategies. Results from Exam 2 were better, but not by much.

Discussions among faculty in the biology department elucidated a common theme, our students are seriously lacking in basic study skills, and many students seem to be striving for the minimum effort to simply pass a course. There also appears to be a lack of appreciation for the skills and effort they will need to succeed when they transfer to a 4-year academic program or further career technical training like nursing.

Tutoring may help some, but most do not make use of the available help, and for tutoring to work students need to study ahead of time and bring questions. One option we are discussing is whether we offer new versions of courses that include a component centering on the skills necessary to succeed in college level science courses. This could be an added discussion component to a course that centers on skills development for studying and succeeding in science.

The solution to this problem, however, may be at a scale beyond the course. Another option under discussion is a "week 0" where students attend the week prior to the start of the semester focusing on the skills and effort required to do well in biology with some focus on the Health Sciences for the many students heading toward the nursing program.

The isolation of COVID seems to have disconnected our students from the reality of what is required of them. Building more of a community around the biology program through the new biology club and department and division events may counter this isolation, bringing together students with different goals and at different levels in their education. Maybe in this way motivated students doing well in biology could influence those that are struggling and provide help and support. The department is currently working toward this goal, supporting a new biology club, adding more department events, and working to create, update, and staff the needed facilities to support this community such as the museum, biology skills lab, and surrounding landscape.

The Scientific Method and Laboratory Work

Many biology courses include in-person laboratory exercises where students learn basic techniques and skills while applying the scientific method of inquiry. The nature of the in-person, hands-on modality results in all students completing the exercises, but the effectiveness of the exercises in achieving the associated SLO's can be limited by available materials and equipment. Biology is a rapidly advancing science requiring regular updates of equipment, quality samples for observation and experimentation, and regular maintenance.

Updated microscopes in Anatomy (BIOL 71), Physiology (BIOL 72), General Microbiology (BIOL 74) and the major's series (BIOL 4A and 4B) have improved the associated SLO achievement and we hope to do the same for other courses, namely General Biology (BIOL 21). Maintaining the equipment in good working condition will require the purchase of a maintenance contract.

Anatomy (BIOL 71), Physiology (BIOL 72), and General Microbiology (BIOL 74) also need clear, up to date, and accurate slides for identification of cells, tissues, microbiota, and evaluation of healthy and diseased states. Over time slides are damaged, scratched, and lost requiring periodic purchasing of new sets. These materials are critical to student preparation and achieving the associated SLO's and PLO's.

Recent purchase of new models for Anatomy has improved the ability to address the content related SLO's. Continued availability of cadavers has provided critical relevance and provides the needed comparison of model to reality. Maintaining and updating equipment like the physiology simulation system called BioPac is essential for achieving SLO's associated with current and industry-standard techniques as well as content associated SLO's like the homeostatic mechanisms addressed in physiology.

The inquiry component of many SLO's can also be improved. With proper equipment, access to fresh samples, and proper facilities, students can take on more student designed inquiry.

Data analysis, information competency, inquiry and reasoning

Human Physiology, BIOL 72, is a course required for all those going into the health sciences including nursing. There are several SLO's associated with the analysis of data and the interpretation of results. The course initially had two lab meetings per week without a discussion. Faculty teaching the course have recently made a change to replace one lab meeting with a discussion where they can focus on clinical case studies to provide a more relevant experience for students going into a career that will require more interpretation than experimentation. There will also likely be a change in the SLO's to better capture this component of the course.

BIOL 4B added a multi-week assignment requiring students to research a topic and report the results in a formal poster presentation, mimicking a common responsibility of professional biologists. This experience adds relevance and builds necessary skills. Hosting the poster presentations in the department museum for the college community added a dynamic, real-world component and another aspect of community building around the biology program.

Overall, our SLO assessments identify a lack of preparation in our students, possibly due to the impacts of COVID, a need for updated and fresh samples, new equipment, consistent equipment maintenance, and opportunities for inquiry. Discussions among faculty and fresh perspectives from an influx of new hires has generated course modifications to improve relevance, development of new SLO's, and plans to address issues common among different biology courses with creative department wide approaches.

Faculty and Staff

Part D: Faculty and Staff

- **1. List current faculty and staff members in the program, areas of expertise, and describe how their positions contribute to the success of the program.**

Name	Areas of Expertise	Position Contribution
May Chen	Microbiology, physiology and cell biology	Teaches microbiology to students interested in the health professions. Teaches general and cell biology for biology majors intending to transfer.
Darcy Ernst	Organismal biology, animal physiology and field biology	Teaches biology majors in organismal biology as well as human physiology for allied health majors. Also teaches biology field and careers in biology course.
Alfred Gonzalez	Environmental science education, general biology, oceanography and genetics	Prepares students for matriculation into higher education and completion of general education science requirements. Also, serves as the ENLACE bio/science coordinator, assists with Chicano/Latino student recruitment into Biology Program and as faculty advisor for the EVC SACNAS student chapter.
Adam Green	Wildlife ecology, toxicology, chemistry and permaculture design	Teaches general biology and field biology courses. Previously taught environmental science, projects in sustainability and methods in field biology.
Lisa Hays	Physiology, oceanography, and plants and human welfare	Teaches oceanography, plant biology and field courses for natural science majors. Also teaches careers in biology course. Chair of the college budget committee.
Jennifer Kurushima	Anatomy and physiology, microbiology, genetics, molecular biology, bioinformatics, evolution, population ecology, marine ecology biology education research	Teaches human anatomy, human biology, and careers in biology course. Also teaches biology field courses. Chair of the professional development committee.
Hoai Nguyen	Microbiology	Prepares and organizes classroom materials essential for teaching students, such as chemical solutions, reagents and science related materials.
Linh Grace Nguyen	Mathematics	Biology skills Lab coordinator. Provides access to anatomy models and biology tutoring services.
Lisa Pang	Molecular and cellular biology, Neurobiology	Teaches both human anatomy and human physiology for allied health students.

Margarita Savageau	Biology, Molecular Microbial, Chemistry	Buys and prepares materials to support biology labs. Maintains inventory of lab supplies and equipment, manages lab budget, assists with planning, coordinates equipment maintenance, and supervises student employees.
Azita Tavana	Microbiology, general biology, genetics, immunology, virology, parasitology	Teaches general biology for non-majors and microbiology for students interested in nursing and allied health occupations.
Thu Tran	Microbiology	Prepares and organizes classroom materials essential for teaching students, such as media, microbiological culture reagents and science related materials.

- 2. In addition to major professional development activities completed by faculty and staff in the past, in particular with regards to students' success, equity, distance education, SLO assessment, guided pathways and/or innovative teaching/learning strategies, are there any additional professional development needs of your department in the future? What are they? Please provide details about a timeline.**

Recent Professional Development

1. May Chen

1. Completed EdD program at Johns Hopkins University in Summer 2023
2. Recent Coursework: Current Topics in Biosciences (UCB), Online Course Development (EDIT 022 at EVC), Introduction to Asynchronous Online Teaching & Learning (@ONE), Introduction to Live Online Teaching & Learning (@ONE), Advanced Techniques with Canvas (@ONE), Equitable Grading Strategies (@ONE), Online Teaching and Design (@ONE)

2. Darcy Ernst

1. Certificate in Online Teaching and Educational Technology (EDIT courses)
2. Student equity grant for MSE division student research symposium (2023-2024)
3. Funded Open Educational Resources cohort (2022-2023, 2023-2024)
4. ESA Life Discovery Conference (2023)
5. NSF S-STEM Mentoring Conference and workshop (2023)
6. EVC Excelencia Seal of Excellence project (2023-2027)
7. BCEENET Course-based undergraduate research experience (CURE)fellowship + CURE implementation (2022-2023)
8. SLO, PLO, ILO assessment and implementation

3. Alfred Gonzalez

1. Involved with the local chapter (AFT 6157) American Federation of Teacher's Union and faculty workplace rights.
2. Mentor new associate and full-time faculty at EVC and Biology department
3. Assist with SLO, PLO and ILO assessments & implementation.
4. Instruct non-science major transferrable bio courses for the ENLACE Academic Program and participants.
5. Maintain DE competency to qualify and maintain certification to teach online.
6. Completed multiple workshops and official distance education courses. Competent with online instruction management system of Canvas for courses offered (Environmental Science 10, Human Heredity Bio 61 and Oceanography 10).

4. Adam Green

1. Developed online texts for lectures and lab courses and has recently developed a new online lab manual for BIOL 21. He incorporates many years of photography experience into his courses and online materials and now includes videography and web design for both courses and departmental materials.
2. Involved with SLO, PLO, and ILO assessments and implementation and represents the MSE division on SLOAC. In addition, involved in updates to biology courses and the biology degrees on CurriQunet.
3. Wilderness First Aid Certification, including use of an epi-pen, and completed a kayak rescue training.
4. EDIT 22: Online Course Development
5. OFAR (Open for Anti-Racism) program sponsored by EVC President's office.

5. Lisa Hays

1. Chair of College Budget Committee
2. Completed 5 college courses in Online Teaching and Educational Technology
 1. Online Course Development (EDIT 22)
 2. Accessible Course Content (EDIT 23)
 3. Women in STEM (EDIT 26)
 4. Online Course Design (EDIT 15)
 5. Copyright and Creativity (EDIT 25)
3. Attended webinars such as College Deaf Culture, Active Learning Strategies, Pathways to Inclusive Higher Education, and College Student Mental Health Crisis

6. Jennifer Kurushima

1. Chair of the Professional Development Committee
2. PI (Principal Investigator) for the Biology department's NSF S-STEM Grant funding our Biology Scholars Program.
3. Maintains DE (Distance Education) competency/certification to teach online.
4. Mentor new associate and full-time faculty at EVC and Biology department
5. Assist with SLO, PLO and ILO assessments & implementation.
6. Training in various online teaching software (PlayPosit, Respondus, VisibleBody, Canvas Studio, etc.)
7. SFSU SEPAL Scientific Teaching Institute - EVC's Humanizing Curriculum & Instruction Faculty Inquiry Group
8. Human Anatomy and Physiology Society Conference, cc Bio INSITES (Community College Biology Instructors Network to Support Inquiry into Teaching Education Scholarship)
9. Attended the California Community College Online Teaching Conference
10. Presented twice at SABER conferences (Society for the Advancement of Biology Education Research)
11. Invited guest editor for CBE-LSE Journal (a biology education research journal) & scholarly research of community college biology student science identity.
12. Published scholarly articles in the field of biology education research
 1. Perkins, H., Royse, E. A., Cooper, S., Kurushima, J. D., & Schinske, J. N. (2023). Are there any "science people" in undergraduate health science courses? Assessing science identity among pre-nursing and pre-allied health students in a community college setting. *Journal of Research in Science Teaching*.
 2. Alvares, S. M., Gonzalez, B., Hewlett, J. A., Kurushima, J. D., McFarland, J. L., Schinske, J. N., ... & Vemu, S. (2022). Centering the Experiences of Community College Students and Faculty in Biology Education Research. *CBE—Life Sciences Education*, 21(3), ed1.
13. Participated with the Humanizing Curriculum Initiative
14. Attended and participated in cc Bio INSITES conferences (2019, 2020, 2021, 2022, 2023)
15. Attended the Western Society of Naturalists conference in 2023.

7. Hoai Nguyen

1. Laboratory Safety Training (Fall 2023)

8. Linh Grace Nguyen

1. Prepare pre-nursing students to have access to anatomy models, provide one-on-one and in group biology tutoring services inclusive to all students of diverse and ability backgrounds, facilitate study workshops to prepare students for exams and boost performance.

9. Lisa Pang

1. Involved with the Curriculum committee which has helped with program/course state mandated updates.
2. SLO, PLO, and ILO assessments and implementation. Updated the BIO AA program on CurriQunet.
3. Physiology lead and changed the format of the physio course from 2 labs and 1 lecture/week to 1 lab and 1 lecture (with incorporated discussion)/week. Modified the SLOs to match a general scheme of 3 (more broadly defined) SLOs/course instead of 5.
4. Participated with the Humanizing Curriculum Initiative and contributed to a proposal that was grant funded.

1. Maintains DE (Distance Education) competency/certification to teach online.
2. Literate with *mentimeter* to get real time feedback from students.
3. Migrated from scantrons to answer sheets for students.

10. Margarita Savageau

1. Laboratory Safety Training (Fall 2023)

11. Azita Tavana

1. SLO, PLO and ILO assessments and implementation(2016-current)
2. New associate faculty mentorship (2016-current)
3. Drafted (2014) and updated (Fall 2022, Spring 2023, and Summer 2023) the Biology Laboratory Guidelines for Biol 021 faculty
4. Served on SLOAC (Student Learning Outcomes and Assessment Committee) (2019-2023)
5. Organized guest speaker event open campus-wide on animal farming and food safety (Fall 2022)
6. Updated Biol 021 Course Outline of Record (Fall 2021)
7. Coordinated SLO assessment and collected data on 13 sections of Biol 021 (2016-2021)
8. Served on multiple hiring committees for full-time and associate biology faculty (2016-2022)
9. Completed Hazardous Waste Management Training for Laboratory (Spring 2023)
10. Completed a DE boot camp (Summer 2021), EDIT 22 (Online Course Development) (Fall 2021), and EDIT 23 (Accessible Course Content) (Fall 2022)
11. Attended multiple webinars on effective use of Studio, Canvas, Proctorio, and Respondus (Spring 2020-Present)
12. Attended webinar: "Proactive and positive ways to engage students about academic integrity" presentation by Jessica Bernards and Wendy Fresh, Portland Community College (Spring 2022)

13. Attended webinar: "Equitable Success for All: The Vision for Success and the Roadmap for California's Future" (Spring 2022)

14. Completed "Humanizing the Curriculum" course (Spring 2022) – Co-wrote a proposal for an initiative to increase awareness of diversity in biology, and was awarded a grant

12. Thu Tran

1. Laboratory Safety Training (Fall 2023)

Future Professional Development for Department

1. Cadaver prosection training for anatomy faculty.
2. Training for faculty to integrate CUREs (course based undergraduate research experience).
3. Training for wilderness first aid and other field-related training for field course instructors.
4. Distance education training during professional development day per semester.

Budget Planning

Part E: Budget Planning

- **1. With your Dean, review the department Fund 10 budget (operational budget) and discuss the adequacy of the budget in meeting the program's needs.**

Account no.	Balance 10/1/2023	Title	Discussion
10-21-6050-00000-55200	\$8,688.74	Hope Grant for student symposium and student conference	Funds provided by President Gilkerson in spring 2023
10-21-6050-00000-55200	\$500	Conference	Used in addition to Professional Development Conference funds.
10-21-0400-00000-55210	\$500	Field Trips	Need: \$13,000 Educational Master Plan Goal: remove barrier of extra fees from students needed to pay for campsites, ice, propane, and park entrance fees. Replace aging camping gear and purchase safety equipment. Cost of courses: \$2,000 x 5 courses = \$10,000/year + equipment
10-21-0400-00000-55230	\$55	Mileage Expense	Adequate

10-21-0400-00000-54300	\$0	Supplies Non-Instructional	<p>Need: \$1,000</p> <p>Safety of students: Need items such as detergent for glassware washer and other cleaning supplies.</p> <p>Quality Programs: Basic office supplies such as folders and sheet protectors are required for supporting a large department laboratory that includes 6 classrooms, 1 skills lab for students to study, 4 classified professionals, and 22 faculty.</p>
10-21-0400-00000-55220	\$0	Subscription/Membership	<p>Need: \$240</p> <p>Safety and State Regulations: Zoleo is a satellite phone service used by faculty to reach emergency personnel during field courses each semester. The department owns a device that transmits signal to a phone via Bluetooth connection. Need yearly service to use device.</p>
10-21-0400-00000-55550	\$0	Waste/Garbage	<p>Need: \$500</p> <p>Safety and State Regulations: Biohazard waste is garbage that needs to be sterilized and cannot be placed in garbage bins. OSHA requires proper disposal or college is fined \$200,000</p>
10-21-0400-00000-55110	\$0	License Renewal Instruction	<p>Need: \$2,500</p> <p>Relate to Mission: Collecting permit for General Biology and Marine Biology (\$1100 for a 3 yr permit) to save \$3500/yr in live specimens.</p> <p>Educational Master Plan Goal: To provide free lab manuals to students need Biorender software for faculty to draw scientific images and publish in public domain free to all students (\$1400/yr)</p>
10-21-0400-00000-55620	\$0	Repair	<p>Need: \$2,500</p> <p>Safety and State Regulations: Sterilizer for bacteria, microscope repair, refrigerators (total of 7, some aging), deionized water system, glassware dishwasher</p>
10-21-0400-00000-5562510-21-6551-00000-55625	\$0	Preventative Maintenance Agreements	<p>Need: \$21,000</p> <p>Safety and State Regulations Maintain microscopes used by 1,600 students each year (\$3,850/yr), sterilizer used to kill bacteria (\$16,884/yr)</p>

10-21-0400-00000-56411	\$0	Equipment	<p>Need: \$4,000</p> <p>Safety of students: New equipment is needed each year to upgrade for safety</p> <p>Innovation: science changes and students need access to modern equipment</p>
10-21-0400-00000-56420	\$0	Equipment Replace	<p>Need: \$5,000</p> <p>Safety of students: broken equipment must be replaced each year. Things like broken, chipped, cracked glassware and other sharps are physical hazards; special grow lamps, broken models, hot plates, and balances need to be replaced periodically.</p>
10-21-0400-00000-55100	\$0	Personal/Contract Services	<p>Need: \$1,000</p> <p>Safety and State Regulations: The Natural Science Museum in Sequoia room 109 needs yearly fumigation to inhibit growth of insects among the taxidermy specimens</p>

- **2. List all external funds, i.e. fund 17, the department/program receives, and describe their primary use.**

Account no.	Balance 10/1/2023	Title	Comments
17-25-0401-22500-54100	\$48,800	Supplies Instructional	<p>Amount was determined by College Budget Committee and President. Funds may need to be transferred to other accounts to cover costs that receive \$0.</p> <p>Primary use: Chemicals, reagents, consumables, mammal organs and animals for dissection, microbiology media to grow bacteria, live specimens for student experimentation, bacterial cultures to grow in lab and provide to students for experiments, two cadavers for anatomy labs, personal protective equipment</p>
17-25-6044-26201-54100	\$54,663.73	Strong workforce R6 in conjunction with Dean Angel Fuentes	Anatomy models, prepared tissue slides, blood-typing cards for pre-nursing courses and biology skills lab for student study

17-21-6050-20400-55820	\$2,975	Student Equity and Achievement Program	Granted for Math/Sci/Engineering Student research symposium (2023-2024)
	\$2,000	Basic Needs	Granted to purchase food and drinks for Math/Sci/Engineering Student research symposium (2023-2024)
17-25-0401-10935-51400	\$107,859.40	NSF S-STEM – Faculty summer NIA	
17-25-0401-10935-53120	\$18,302.48	NSF S-STEM – Faculty summer NIA (Benefits)	
17-25-0401-10935-53320	\$1,565.30	NSF S-STEM – Subaward to Iowa State University	
17-25-0401-10935-53620	\$1,851.86	NSF S-STEM – Faculty summer NIA (Benefits)	
17-25-0401-10935-54100	\$8,200.00	NSF S-STEM - Noninstructional supplies	
17-25-0401-10935-55200	\$8,090.00	NSF S-STEM – Conference Travel	
17-25-7310-10935-57314	\$18,175.00	NSF S-STEM – Indirect costs	
17-25-7323-10935-57601	\$430,000.00	NSF S-STEM – Student scholarships	

Technology and Equipment

Part F: Technology and Equipment

- **Review the current department technology and equipment needed and assess program adequacy. List and changes to technology or equipment since the last program review. If changes were made please indicate how the change impacted student success.**

The Biology Department comprises six laboratory classrooms and several preparation and storage areas. Two of the labs are equipped with gas, air, and vacuum outlets, three have gas and air outlets, and one has gas outlets. Three of the labs feature fume hoods, while one is equipped with a biological hood. Additionally, there is a dedicated Anatomy lab with an adjacent room equipped for cadaver dissections and a separate lab for teaching Microbiology. Another lab is dedicated to the study of Botany and is located adjacent to a small greenhouse without plumbing for water. The remaining three labs are versatile and can be used for various Biology courses. All labs are furnished with computers and data projectors.

BIOLOGY COURSES WITH LABS:

Biol - 004A – General Principles & Cell Biology
Biol – 004B - Organismal Biology & Biodiversity
Biol – 014 – Head Smart into the Sciences
Biol – 020 – Human Biology
Biol – 021 - General Biology
Biol – 064 - Marine Biology
Biol – 071 - Human Anatomy
Biol – 072 - Human Physiology
Biol – 074 - General Microbiology
Envir – 010 - Environmental Science

BIOLOGY FIELD COURSES:

Biol – 080A – Field Biology – Canyons and Cliffs
Biol – 080B – Field Biology – Birds and Blossoms
Biol – 080C – Field Biology - Coastal California
Biol – 080D – Field Biology – Desert and Dunes
Biol – 080E – Field Biology – Mountains
Biol – 080F – Field Biology - Forest and River Ecology
Biol – 080G – Field Biology - Volcanoes of California

EQUIPMENT:

Analytical Balances
Anatomical Models
Articulated skeletons
Audiometers
Autoclave
Botanical models
Cadaver dissecting tables
Cadavers
Centrifuges
Combination Hot Plates/Magnetic Stirrers
Dissecting Microscopes
Explosion-proof refrigerators
Glassware washer
Grow labs
Incubators
Laboratory carts
Laptop computers
Microscopes
pH meters
Refrigerated cadaver storage unit
Sliding door refrigerators
Spectrophotometers
Thermocyclers
Unarticulated skeletons
Water baths
Zoological models

MATERIALS:

Blank microscope slides and cover slips
Blood
Blood sera
Blood testing supplies
Buffers

Chemicals

Cuvettes

Dissecting materials

Dissecting tools

Dissecting trays

Face Masks

Glassware (beakers, flasks, pipettes, graduated cylinders of different sizes)

Gloves

Ice buckets

Lab aprons

Lab coats

Lancets

Masking tape

Micropipettes

Microscope bulbs

Petri dishes

Pipette aids

Prepare microscope slides

Reagents

Safety goggles

Sleeve protectors

Solutions

Test Tube racks

Test tubes

Thermometers

WASTE:

Hazardous waste (once-a-semester pickup) currently paid for by the District Office

Biomedical waste (once-a-semester pickup) paid for by the Biology Department

EQUIPMENT MAINTAINANCE and COST:

Stericycle Biohazardous waste pick-up

\$500 paid by the department

ADDITIONAL MAINTAINANCE NEEDED

Microscopes serviced once a year

Sterilizer and glassware washer serviced four times a year and as needed

Fumigating the museum, needs to be an annual event, currently done as needed

Since the last program review, there has been a gradual replacement of biology equipment. Unfortunately, this process has been slow due to budget constraints. The microscopes and models, which are extensively used across by 1,600 students each year, have suffered wear and tear without sufficient funds for maintenance or replacement. As a result, we have had to resort to using damaged equipment and models. It is essential that equipment and materials are regularly replaced and updated. There should be a dedicated ongoing fund 10 budget to do this.

Since the last program review, the Biology Program received COVID Higher Educational Relief Funds to bring students back to campus safely during the pandemic. We added a set of new classroom laptops and BioPac software to run physiology experiments that include electrocardiograms (EKG), pulmonary lung volumes, reaction times, biofeedback, and electromyograms (EMG). The department received new microscopes for the microbiology lab classroom. In addition, the cadaver refrigerator unit, three refrigerators, sterilizer, and glassware washer have been replaced. Some of the anatomy models and prepared slides have been replaced. The department received four thermal cyclers/PCR, new Bunsen burners, audiometers, lab chairs, one microbiology incubator, grow lab lamps, binoculars, dissection kits, pH meters, salinity testers, electrodes, micropipettes, and balances.

Unfortunately, there is currently no dedicated budget for the repair of biology equipment the Fund 10. This leaves us in a precarious situation, especially when critical equipment like refrigerators, ovens, incubators, and the sterilizer experience issues. The uncertainty surrounding the availability of repair funds can lead to disruptions in classes, particularly in the Microbiology department, which heavily relies on the sterilizer to clean items of bacteria.

There is also no dedicated budget for equipment maintenance in Fund 10. Sometimes the District covers the cost and sometimes it doesn't. When the instructional budget is uncertain, the cost of \$500 Biohazard waste removal or \$240 emergency satellite communicator annual subscription for field courses lowers the quality of the experiments we can offer our students in lab classes. The District should assume responsibility for all equipment maintenance costs, allowing the instructional budget to be exclusively allocated to instructional supplies.

ESSENTIAL OPERATIONAL SUPPLIES

Aluminum foil saran wrap - all

Aquifer kits – Envir 10

Autoclave parts - all

Blood agar plates – Biol 74

Enteropluri media strips - Biol 74

Band-aids— Biol 71, 72

Bibulous paper – Biol 4A, 4B

BioPac electrodes and replacement parts-- Biol 72

Blood sera— Biol 72

Bottled water-- Biol 72

Calculators – all

Camping equipment – Biol 80

Centromeres—Bio 4A

Chara—Bio 21

Chemicals—all

Clothespin – Biol 4A, 4B

Containers for biohazard waste - all

Coffee filters— Biol 20, 21, 4A

Cow eyes— Biol 71 and 20

Crabs— Biol 64, 4B

Cultures— Biol 4A, 4B, 21 and 64

Cut flowers— Biol 4B

Dialysis clamps

Dialysis tubing

Disinfectants – Biol 4A, 4B, 74

Disposable aprons— Biol 71

Dissection equipment— Biol 71, 4A, 4B, 64

Dissection materials

Dixie cups— Biol 20, 21, 4A

DNA fingerprinting— Biol 4A

Dogfish— Biol 4B and 64

Dropper bottles – all

Eldon cards—blood testing— Biol 71

Elodea— Biol 4A, 4B, 20, 21, 64

Frogs— Biol 4B

Gladiolas— Biol 21

Glassware—all

Gloves--all

Grocery items (milk, eggs, meats, veggies, flowers) - all

Household solutions – Biol 4A, 14, 21, 74,

Hydrometers – Biol 4A, 64

Immersion oil – Biol 74

Inoculating loops – Biol 4A, 74

Kimwipes – Biol 4A, 64

Lab coats – 4A, 74, 4B, 72, 74

Labeling tape--all

Lambda DNAs— Biol 4A

Lancets— Biol 71, 72

Lens paper—all

Lightbulbs – Envir 10, Biol 21, 72

Live plants – Biol 21, 4A, 4B

Magnifying glasses – Biol 21, 64

Microbiology cultures – Biol 4A, 4B, 21, 20, 74

Microbiology media - Biol 4A, 4B, 74

Microbiology stains - Biol 4A, 4B, 74

Micropipette tips— Biol 4A

Moss—Bio 21

Pasteur pipettes, disposable - all

Parafilm— Biol 4A, 4B, 64

Perch— Biol 4B and 64

Petri dishes – Biol 4A, 4B, 20, 21, 74

pH paper— Biol 4A, 21, 72

Pine nuts— Biol 21

Plants— Biol 4A, 4B, 21

Plastic bags/Ziploc – Biol 21, 71

Posters Bio - all

PTC paper— Biol 4A, 4B 20, 21, 72

Red biohazard bags - all

Recombinant DNA and transformation—4A

Refractometers – Biol 4A, 64

Rulers - all

Scissors – all

Sandwich bags— Biol 20, 21, 4A

Seeds— Biol 4B

Sharpies

Sheep brains— Biol 71 and 20

Sheep hearts— Biol 71

Sheep kidneys— Biol 71

Sigma Aldrich sera and chemicals— Biol 4A

Slides and coverslips—all

Soil testing kits – Envir 10

Staining trays – Biol 4A, 4B, 72, 74

Stopwatches – Biol 4A, 14

Strawberries— Biol 20, 21, 4A

Thermometers

Tuning forks

Ulva— Biol 4B

Urine strips— Biol 4B, 20, 72

UV lights – Biol 20, 74

V 8— Biol 72

Water testing kits – Envir 10

Wax pencils - all

Wisconsin Fast Plants kits— Biol 4A, 4B

NEEDED EQUIPMENT

Anatomy models

Botany models

Biology models

Microscopes with cameras for instructor desks

3D printer to create biological models and replace broken parts

Analytical balances (3)

Cactus garden, shed, tools, water

Combination hot plates/magnetic stirrers (3) – do not have enough to meet the needs of classes

Distilled water cartridges – for all lab courses needing water and solutions

DNA transformation

Forensic DNA

Glass shelves for museum – need additional shelving for display cases and need to secure existing shelves

Greenhouse renovation for water and air ventilation

Histology slides

Ice machine – use of ice is greater than ice trays from freezers can supply

Instructional outdoor garden for general biology

Liverwort (Marchantia)

Moss (Mnium)

Club moss (Lycopodium)

Spike moss (Selaginella)

Horsetail (Equisetum)

Whisk fern (Psilotum)

Other types of Ferns

Cycad (Zamia)

Cactus

Lilium

Ephedra

Pine tree

Cup fungi

Mushrooms

Puffballs

Fruticose lichen

Microscopes for General Biology (30) - Dissecting microscopes (15) + Compound microscopes (15)

Models (botanical, biological, anatomical) – need to replace worn and broken models

Museum computer and projector

Museum sun-blocking screen – retractable for ceiling

Native plant garden

pH electrodes (6) – need for replacement

Physician's scale – 40 years old and broken

Prepared microscope slides – classroom sets

Shaking water bath for microbiology lab

Student kits: majors biology

Trailer for field courses

Vegetable and flower seeds – majors biology

NEEDED REMODEL TO BUILDING

Light switches near entrance doors – currently the switches are only by the inside door which requires crossing unsafely across a dark classroom to turn lights on and off.

Plumbing for water to the greenhouse and air ventilation

Repair kick plates and table legs in all biology labs

Blind pulls need repair in several biology labs

Coat racks in all lab classrooms

Microbiology lab lockers need repair – doors don't close and doors missing

Additional space in Sequoia remodel for anatomy theater

Additional space in Sequoia remodel for biology skills lab

Additional space in Sequoia remodel for additional biology lab classroom

Additional space in Sequoia remodel for Faculty offices- currently, one full-time faculty does not have an office in Sequoia making the day to day challenging, and the department is planning on hiring another full-time faculty member.

Additional Information

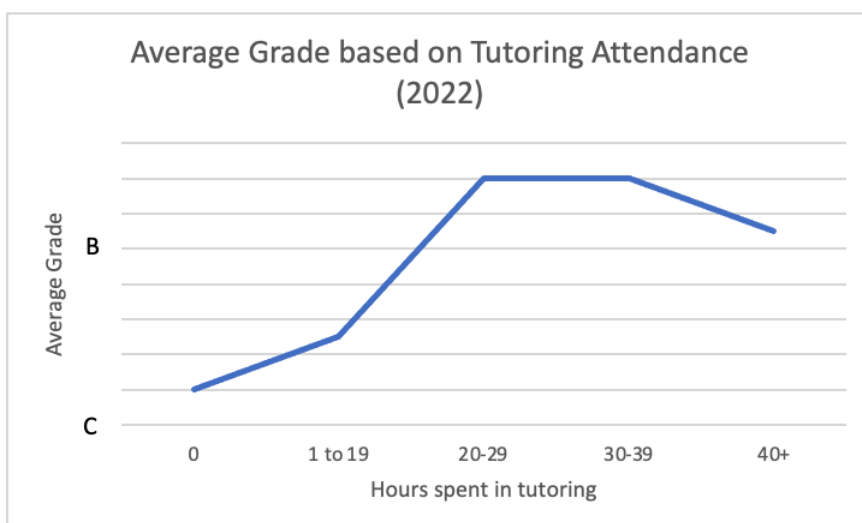
Part G: Additional Information

- **Please provide any other pertinent information about the program that these questions did not give you an opportunity to answer.**

The General Studies with an Emphasis in Health Science major is currently the #2 major at EVC. Between 2018 and 2022, **539 EVC students earned an AA degree for this program**. Although the number of students in our program have increased over the years, the average student success rate continues to be lower (68.16%) than the campus success rate (72.31%) with significant equity gaps for our Asian (-4.35%, n=281), Hawaiian/Pacific Islander (-9%, n=3), and Latinx (-6.02%, n=216) students.

The Biology Skills Lab is a tutoring center on the second floor of the Sequoia Building where faculty-recommended student tutors, under the guidance of the Skills Lab Coordinator, provide workshops and tutoring support for students in this program. The Skills Lab provides students with a variety of biology and human anatomy models, microscopes, slides, and similar resources that students use during their biology lab classes that allow them to prepare for labs and reinforce their learning from previous labs. The Biology Skills Lab is helping students meet the *EVC Mission and Strategic Initiative: Provide access to quality and efficient programs and services to ensure student success*. Access to the tutoring and materials in the Skills Lab is a service that ensures student success in our program.

The Biology Skills Lab serves all the classes in this program, from general biology to microbiology, in addition to students from other majors that are currently enrolled in a biology course – more than 29 biology classes and 725 biology students each semester. Furthermore, there is a clear, positive correlation between the time spent in the Skills Lab and students' final grades in our courses as depicted through the findings of a recent study conducted by our Anatomy instructors:



Unfortunately, equity gaps currently exist for many of the students we serve due to the limited hours that the Skills Lab is available to students. Currently, the Biology Skills Lab is closed after 3PM Monday-Friday, which means students enrolled in our late afternoon and evening courses—generally, our working and caregiver students—do not have access to the Skills Lab.

These evening students make up 48% of our Biology students. The Skills lab is also closed during the summer during our fast-paced courses, leaving these summer students without a space to practice or review critical concepts from class. The college Educational Master Plan has two goals, one of which is to “*Eliminate equity gaps in goal achievement*.” Expansion of the Biology Skills Lab will help our students reach that goal.

According to the literature, working students face several barriers to academic success, including feeling segregated from full-time learners while facing difficulties accessing institutional resources due to their limited time on campus (Lee, 2018). As the Biology Skills lab is a safe and welcoming space on campus, our students also build community and strong peer relationships while studying, factors that have been shown in the literature to increase student success in higher education, especially for traditionally underserved student populations. This addresses another *EVC Mission Strategic Initiative: building campus community*. The Biology Skills Lab is a space for peer mentoring, faculty mentoring, and a place where students form friendships with peers throughout the department.

Finally, success for students in this program also leads to success for the wider community, as many of our Health Science students and graduates continue to serve the local community after succeeding in our courses and program.

The department currently has 4 Part-Time classified employees. These individuals put in a total of 6678 permanent Part-Time hours/year to prepare, maintain, clean up, and otherwise support more than 30 biology classes and 750 lab students each semester. One of the classified employees is an Instructional Support Assistant, Lab Lead (Biology). A second part-time Biology Skills Lab Coordinator position will allow us to open the Skills Lab in the late afternoons, evenings, occasional weekends, and summers, and narrow or potentially eliminate the current gap in equitable access to the tutoring and materials that are imperative to success for our Health Science students. The department is need of an additional 11-month, Part-Time classified employee for 30 hours/week – Instructional Support Assistant, Lab Lead (Biology) - to open the doors to access for all students, whether day or evening, full-time or part-time, working or caregiver, and throughout the fall, spring, and summer semesters.

Future Needs and Resource Allocation Request

Total Cost

Attach Files

Attached File

Health Science Budget Request 2023_2024.pdf (/Form/Module/_DownloadFile/5087/43692?fileId=459)

IEC Reviewers

IEC Mentor

Robert Brown

IEC Second Reader

Fahmida Fakhruddin