

## Instructional Comprehensive Program Review: 2023-24 Biology Comprehensive PR

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## Overview

**Program Review Year** 2024**Title** 2023-24 Biology Comprehensive PR**Year of Last Comprehensive Review** Fall 2018**Year of Last Mini Update, if applicable** 11/30/2021**Originator** Hays, Lisa**Area Dean** Antoinette Herrera**Division**

Math, Sci. &amp; Engineering

**Department**

Biology

## Subject

- BIOL - Biology

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

## Degree

- Biology, Associate in Arts - Active
- Biology, Associate in Science for Transfer - Active

Co-Contributors

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\*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

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**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.**

The Biology Program began in 1975 with the opening of Evergreen Valley College. Today, we offer a wide range of courses in animal biology, plant biology, human biology, environmental science and oceanography. The classified professionals and faculty in the Biology Program are dedicated to offering our community college students a high-quality educational experience. Most of our students are exploring biology for their general education requirements. Many are preparing to enter allied health careers such as nursing and others are planning to major in Biology and transfer to a four-year college or university.

The construction of the Sequoia building in 2002 gave the Biology Department the opportunity to expand course offerings. We offer almost 100 sections of biology courses each year and rarely cancel sections due to low enrollment. We serve almost 2,000 students each year and now offer four associate degrees. 1) Associate of Arts in Biology 2) Associate of Science Transfer in Biology 3) Associate of Arts in General Studies, emphasis in Natural Science and 4) Associate of Arts in general Studies, emphasis in Health Science. The contribution of the four degrees to the total number of degrees offered by the college, the number of degrees awarded by the college, and the number of students graduating are significant factors in determining a college's success.

The greatest factor that is important to the program's development is funding. For decades the Biology Program did not receive funding to hire additional full-time faculty, additional classified lab technicians, or funds to purchase instructional supplies, equipment and contracts. With the distribution of Higher Educational COVID Relief funds, the biology department received

almost \$500,000 in federal funds to upgrade equipment, purchase new models, microscopes slides, lab coats, chemicals, and organs for dissection. We also hired a temporary lab technician to prepare the workspace for students to social distance in class. EVC Biology students came back to lab classes when all other community colleges in our area, except for one, were still performing online experiments.

With a new college president came a new process by which the college distributes funding for academic and classified hires as well as discretionary funds. With a fair and equitable process, the Faculty Hiring Prioritization committee gave an opportunity for all programs to show their need for an additional full-time faculty member using their program review data and analysis. Biology received one of the ten full-time appointments distributed in 2021. Likewise, the new Classified Hiring Prioritization committee gave the same opportunity to the campus and the Biology Department received one of only **two** newly created classified positions for the college in 2022. Finally, the president discontinued the roll-over of budgets year after year and created a system in which program reviews are used to determine the distribution of discretionary funds. The system now involves the College Budget Committee reading program reviews or annual requests and forwarding their recommendations to the College Council. The College Council then advises the president who makes the final decision. Again, Biology ranked high, and our budget increased from \$15,000 to \$48,800.

The Biology Program is finally being recognized and supported by our colleagues across campus as well as managers and administrators. Now we can focus on our number one priority which is educating our students. The department is committed to the Educational Master Plan of 1) Eliminating Equity Gaps in Goal Achievement and 2) Shorten Student's Time to Educational Goal Completion with details outlined in this document. We are also guided by the college's mission of being Student Centered, Community Engagement and Organizational Transformation and look forward to sharing our accomplishments and goals in this program review.

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

The Biology Department accomplished three of our four goals!

Our first goal was to receive funding for an 8th full-time faculty member to teach General Biology, which has grown to be our largest course in terms of the number of sections offered and the number of students served. Over 700 students take this biology lab class each year. The college president accepted our request and in fall 2022 we hired Dr. Adam Green who comes with a wealth of experience as a 20-year community college professor. He spent his first year writing a free, online lab manual for the General Biology students which is in line with the Educational Master Plan to eliminate the equity gaps in goal achievement. With 8 full-time faculty, the department can now keep up with the demand of curriculum development, course and program assessments, outreach to the community, and bring our attention back to the classroom where our students need us the most.

Our second goal was to increase the Biology Skills Lab hours to accommodate our afternoon, night and weekend students. Unfortunately, this was not achieved. The Biology Skills Lab is directly linked to EVC's first strategic goal of the Educational Master Plan: Eliminate Equity Gaps in Goal Achievement. Students who visit the Biology Skills Lab spend time studying with the right tools and guidance from the Instructional Assistant. The lab includes many of the same plastic models that students use in their laboratory classes as well as charts, computer

software, and microscopes with slides. The Biology Skills Lab also hosts space for the biology tutors to meet with students and host workshops. The limited hours of 8:30AM-3PM Monday through Friday only allows morning students to visit. An afternoon/evening student who wants to visit before or after class would want to come around 5PM, yet the Skills Lab is closed. In the past, the Skills Lab was open on Saturdays before anatomy exams and those times were heavily used by students wanting extra study hours. The department would like to bring those hours back.

The department uses space on the 2nd floor of the Sequoia building to provide a Biology Skills Lab that is open 30 hours/week for student study time. The original room and attached office space were taken over by the Nursing department. The Biology Skills Lab was moved to a much smaller conference room, S-219, that lacks the required space for storing plastic models, office space for the Instructional Assistant, and tables for students to study. The department is requesting a remodeling of S-219 to bring back the office space for the Instructional Assistant.

Our third goal was to increase the Biology Instructional Supply budget. For the first time in over 30 years, there are sufficient funds to serve our students in their laboratory courses. The College Budget Committee reviewed our request for funding and the proposal ranked in the top 15 out of 55 submissions. The department was given \$48,800 in Fund 17 to spend on items listed in the program review and annual request. The next step is to get this budget permanently moved to the General Fund 10 so we can rely on a steady \$50,000 each year.

Our last goal was to increase the number of and properly upgrade the classification of our laboratory technicians. Another win for our department! The department wrote a strong proposal for a full-time evening Instructional Laboratory Technician III and received one of only two new classified positions added to the college. Hoai Nguyen was hired in fall 2022 for this position and now night students and faculty are fully supported with Hoai's guidance. Laboratory safety is now prioritized to serve night students just as the day students have been served for decades.

In addition, our Lab Technician IV, Margarita Savageau, applied for reclassification to be a Lab Coordinator. Her application was accepted and now the department has a coordinator to track the budget, coordinate workload of lab techs, supervise student employees, and collect and compile data for program activity. Margarita also mentors the work-study students who require training and guidance to prepare lab materials for courses. Her participation in the work-study program gives our students a rare opportunity to participate in the real workings of a laboratory. Margarita can also share her own community college experience with them and is a role model for them to see that the path to university is possible for them as well.

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

Recent Accomplishments:

1. Online Textbooks: Besides the three goals mentioned in the previous section, one of our recent accomplishments was the publication of **five** free, online textbooks/lab manuals. Providing free textbooks to our students meets one of the college's strategic goals: Eliminate Equity Gaps in Goal Achievement. Several biology faculty received grants from the college president to write and publish Open Educational Resources (OER) to be shared through the online platform LibreText. Professors May Chen, Darcy Ernst, Katie Folz and Bridget Greuel wrote a lab

manual for the two-semester biology majors series: Cell/Molecular Biology and Organismal Biology. Professor Sara Kappus, an associate faculty, wrote an entire Ecology textbook. Although not published as an online OER, Professor Adam Green wrote the general biology lab manual to be used by hundreds of EVC students each year. Human Biology and Human Anatomy lab manuals were written by Professor Jennifer Kurushima and are provided to students free of charge.

- Cell and Organismal Biology Lab Manual: 200 students/yr x \$74 = **\$15,000** savings/yr
- Ecology Textbook: 60 students/yr x \$120 = **\$7,200** savings/yr
- General Biology Lab Manual: 700 students/yr x \$70 = **\$49,000** saving/yr
- Human Biology Lab Manual: 300 students/yr x \$139 = **\$41,700** savings/yr
- Human Anatomy Lab Manual: 150 students/yr x \$88 = **\$13,200** savings/yr

2. New Course: Another accomplishment was the launch of our newest course, BIOL 014, Head Smart into the Sciences. This 3-unit class was inspired by the curriculum of Counseling 014 but created specifically for students interested in biology. In this course students are introduced to biology careers, transfer and financial aid, the importance of networking and building relationships, applying for internships, and strategies to succeed in their science courses. BIOL 014 is taught by three faculty who are building connections with students and helping them build relationships with one another. Every semester faculty take students to visit Santa Clara University and now we have a partnership with SCU to enhance transfer of our community college students. This collaboration addresses the college Strategic Goal of Community Engagement by developing strategic partnerships.

Students from the first semester of BIOL 014 started the first ever EVC Biology Student Club. The course and club support the college Educational Master Plan specifically by addressing the key action of *“Increase on-campus and community-based student engagement opportunities to create student belonging and support.”* The class enrollment continues to grow, and the biology faculty recommend it to all students who major in Biology.

3. NSF Grant: The biology program successfully launched the National Science Foundation Biology Scholars Program in January 2023. Professors Kurushima, Ernst, and Hays worked in collaboration with an educational researcher from Iowa State University, Dr. Michael Brown, and received a National Science Foundation grant to give 45 low-income biology students \$10,000 scholarships. 10 students began the program and received \$2,500 during the first semester. This program addresses the *Educational Master Plan of Eliminating Equity Gaps and the scholarships allow students to work less which is important for Shortening Students’ Time to Educational Goal Completion.*

Students attend monthly mentoring meetings with faculty, larger group meetings with their peers, and participate in regular events. In spring 2023, faculty took students to visit CSU Monterey Bay and the Monterey Bay Aquarium Research Institute. In September 2023, students traveled for free to Washington D.C. with Dr. Ernst to attend the NSF S-STEM Student Mentoring conference. In October, students and faculty attended a private tour of six Stanford University research laboratories and Dr. Ernst is now in conversations with Stanford to create paid internships for our students. In November, the students and faculty attended a 3-day conference for the 104th meeting of the Western Society of Naturalists in Monterey, CA. The NSF biology team, which includes Dr. Ernst, Dr. Hays, and Dr. Kurushima, devotes many hours each month to the planning of events for the Biology Scholars. A new cohort of 10 students will join the first-year students in the spring of 2024.

- **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)**

In fall 2022, the college altered the process for distribution discretionary funds to programs across campus. The Biology Department submitted an Annual Update/Resource Request. Our priority was \$48,800 for supplies for laboratory courses followed by \$22,000 for contracts and then \$7,000 for equipment. The request ranked in the top 15 as scored by the College Budget Committee. Biology received \$48,800 for supplies. This is double the amount that we usually receive from Fund 17: Lottery/Grant.

Funding was delayed from the start of the fiscal year on July 1, 2023 to October 1, 2023 as the college waited for a final decision from the president's office. With only two months of spending, we are just beginning to receive items purchased for classroom instruction.

- **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: Evening/weekend Instructional Support Assistant for Biology Skills Lab

*Educational Master Plan: Eliminate equity gaps in goal achievement **and** Shorten student's time to educational goal completion*

Approximately **2,000** students take a Biology lab class each year. How can a lab student study best for a lab class? They need a space to practice using a microscope, to quiz their lab partners on parts of a muscle, to review the same materials that they saw in lab earlier in the week. The hours of the Biology Skills Lab is 8:30AM-3PM Monday through Friday and only allows for morning students to visit. Only 52% of EVC Biology students are day students. The other 48% do not have access to the Skills Lab to study.

This goal is being rolled over from the last program review and it is now our #1 priority. We are requesting a part-time, 30 hr/wk, instructional support assistant to work evenings and Saturdays.

Goal 2: Support for Associate Biology Faculty

*Educational Master Plan: Eliminate equity gaps in goal achievement*

The biology department will focus on attracting faculty applicants from historically underrepresented backgrounds. The department will promote and post the new positions with professional organizations such as with professional organizations such as American Indian Science and Engineering Society (AISES) and Society for the Advancement of Chican@s and Native Americans in Science (SACNAS) and American Association for the Advancement of Science (AAAS). The application process will be open and ongoing so there is always a pool of applicants for associate faculty positions. The process will be reviewed periodically by the department coordinator and dean so we can better recruit for our needs.

We will develop a mentoring program for associate faculty. EVC can become known as a training program for associate faculty looking to continue in education or looking to move to a full-time position. By formalizing a mentoring program, we can better train our associate faculty for our courses

and develop their skills for future courses and applications. With a program like this our associate faculty will feel more valued and word of mouth will increase the attractiveness of our department to associate faculty in our area and graduate students looking to develop their teaching skills. Along with the dean, the department will create a scheduling process for associate faculty that is more responsive to their needs. Currently, associate faculty are assigned courses in a way that often moves them from one course to another making it challenging to plan and prepare. If we can better schedule associate faculty so that they can stay within a particular course and modality, then their preparation time is lessened, and they are more likely to remain with the department long term.

Goal 3: Facilities Repair and Expansion

*Educational Master Plan: Eliminate equity gaps in goal achievement*

*Key: Increase on-campus and community-based student engagement opportunities to create student belonging and support.*

The Sequoia building was completed in 2002 and as we know, bonds do not pay for repairs 20 years later. Even as a new building, there were errors that should have been corrected by the builder. For example, the greenhouse has an open electrical system such that the self-watering system cannot be used. The greenhouse also has no heating/cooling system which prevents plants from surviving the extreme temperatures of summer and winter. It has never been used and needs to be repaired.

Another room is the Natural Science Museum that contains hundreds of taxidermy specimens. There is no sunscreen over the skylight which exposes the room to UV light, causing damage to the museum exhibits. The roof is leaking and there continues to be water damage. The museum is underutilized and needs some changes to make it more accessible and resilient to higher student use. It does not contain the basic computer and data projector needed to host a lecture for students. The museum should be a highlight of the campus. It is a space that could bring together all the campus community.

Finally, there are 8 full-time faculty and only 7 offices in the Sequoia building. This makes it difficult for students to have access to their office hours. It also gives new faculty the impression they are less valued and makes the day-to-day work more challenging. There are 4 offices in Sequoia on the first floor being used by the J.E.W.L program which is a community program that uses office space on the EVC campus to promote the oral history of the African American community. The program is used by history students and should be moved closer to the History Department so faculty can monitor the research of their students.

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 71.67%**

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

**Program Set Standard 64.50%**

**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 (recommend 73% or 75%)**

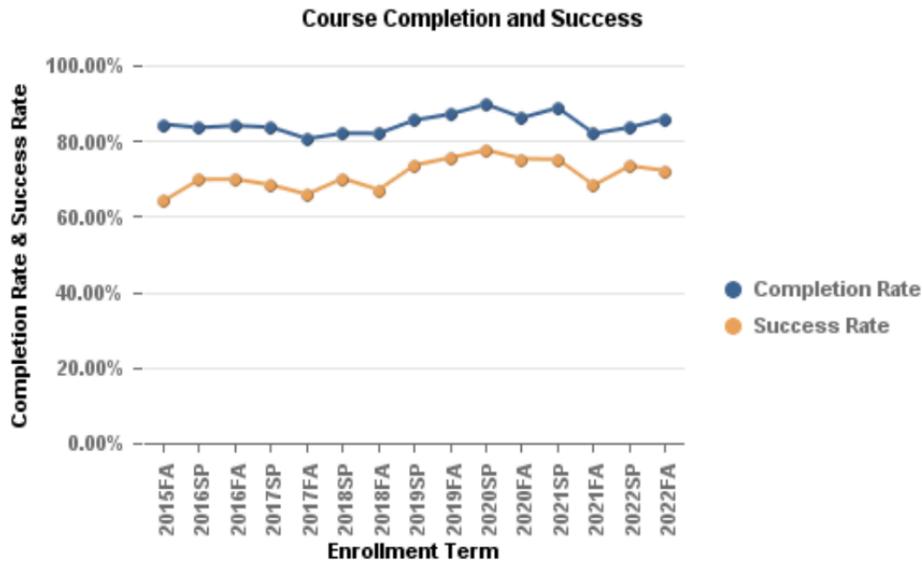
- **Is your program success rate higher or lower than the campus?**

Our program success rate is 0.64% 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 slightly lower (-0.64%) 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. Finally, three of our full-time faculty members developed a new course for students interested in the sciences and biology: BIOL 014 Head Smart into the Sciences. In addition to introducing students to various science careers and pathways, this course also provides students with many opportunities to engage in and practice various educational strategies and develop growth mindsets for success in biology lecture and laboratory courses. Finally, one of our new program goals is to increase support for associate biology faculty. By developing a mentoring program for our associate faculty who teach a significant portion of our course offerings, we can share, develop, and continually improve classroom and teaching strategies that promote student success in our courses.

Biology Program Average Course Completion and Success Rates (2015 – 2022):



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

Our current program success rate is 7.17% higher than the program set standard.

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

Our average program success rate is currently higher than our program success goal (+0.67%). Although our success rate fluctuates from semester to semester, ranging from a low of 64.11% in fall 2015 to a high of 75.52% in fall 2019, our program success rates have been increasing, especially in the more recent years (2019 to 2022).

- **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**  
 89.480
- **Asian: 9182 - 79.970%**  
**Program Average Total Enrolled**  
 442.000  
**Program Success Rate**  
 78.810

- **Black or African American: 455 - 61.770%**  
**Program Average Total Enrolled**  
21.000  
**Program Success Rate**  
57.040
- **Hawaiian/Pacific Islander: 85 - 62.970%**  
**Program Average Total Enrolled**  
5.000  
**Program Success Rate**  
58.490
- **Latinx: 8952 - 64.890%**  
**Program Average Total Enrolled**  
388.000  
**Program Success Rate**  
63.410
- **Two or More Races: 609 - 70.560%**  
**Program Average Total Enrolled**  
33.000  
**Program Success Rate**  
73.400
- **Unknown: 1397 - 72.850%**  
**Program Average Total Enrolled**  
54.000  
**Program Success Rate**  
70.100
- **White: 1207 - 73.590%**  
**Program Average Total Enrolled**  
62.000  
**Program Success Rate**  
77.860

## Success Rates: Measures by Gender

- **Female: 12034 - 74.070%**  
**Program Average Total Enrolled**  
654.000  
**Program Success Rate**  
71.510
- **Male: 9868 - 70.160%**  
**Program Average Total Enrolled**

350.000

**Program Success Rate**

71.840

- **No Value Entered: 76 - 72.420%**

**Program Average Total Enrolled**

3.000

**Program Success Rate**

79.720

## Success Rates: Measures by Age

- **17 & Below: 791 - 87.140%**

**Program Average Total Enrolled**

27.000

**Program Success Rate**

87.560

- **18-24: 14936 - 69.850%**

**Program Average Total Enrolled**

728.000

**Program Success Rate**

70.330

- **25-39: 4313 - 75.310%**

**Program Average Total Enrolled**

219.000

**Program Success Rate**

73.540

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

**Program Average Total Enrolled**

34.000

**Program Success Rate**

74.980

- **Unknown: 11 - 65.690%**

**Program Average Total Enrolled**

0.000

**Program Success Rate**

0.000

- **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 very similar to or higher than our campus success rates. Student groups that appear to reveal the most significant equity gaps include the following: Black or African American students (-4.73, n=21), Hawaiian/Pacific Islander students (-4.48, n=5), female students (-2.56, n=654), and students 40 & Over (-3.4%, n=34). The most significant intervention currently employed by our department is the BIOL 014 course (Head Smart into the Sciences) designed to provide new science students with the opportunity to engage in and practice various educational strategies and develop mindsets for success in biology lecture and laboratory courses. This course was first offered in fall 2022, and strategies implemented in this course align with the needs of underrepresented students in STEM as revealed by the literature. Additional strategies that have been implemented by our 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. We will reassess the effectiveness of BIOL014 and 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 biology department's disaggregated success rates are much higher (ranging from +5.6% for Unknown Ethnicity students to +24.98% for American Indian students) than our program set standard of 64.5%. Student groups with success rates that are lower than the program set standard for Biology include the following: Black or African American students (-7.46, n=21), Hawaiian/Pacific Islander students (-6.01, n=5), and Latinx students (-1.09, n=388). 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 (+6.5%) 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: Black or African American students (-13.96, n=21), Hawaiian/Pacific Islander students (-12.51, n=5), and Latinx students (-7.59, n=388). The higher percentage of the program success goal also reveals student performance differences in two additional groups. Students in the Unknown race/ethnicity category are performing at a 0.9% lower success rate, and students between the ages of 18-24 are performing at a 0.67% 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.**

Analysis of the differences between fully online and face-to-face biology courses reveal the following differences for our program when examining average rates from 2016 to 2022:

Average rates from 2016-2022	Fully online biology courses	Face-to-face biology courses
Completion rate	89.18%	84.29%
Success rate	80.74%	72.03%

Our fully online courses have greater completion and success rates compared to our face-to-face courses. A closer examination of the success rates for each semester reveal similar trends: success rates for our online courses were consistently higher than our face-to-face courses, even prior to the Covid pandemic.

Although a review of the current educational literature regarding online learning suggests that success rates tend to be higher in face-to-face courses, we believe our high online success rates are due to the training our faculty have completed through the online teaching courses offered to our instructors, including EVC's EDIT courses, as well as courses offered through the California Virtual Campus @ONE program.

We have continued to offer an online curriculum that is as interactive and rigorous as our face-to-face courses by incorporating multimedia content and maintaining the contact hours critical to student success in online courses.

## Program Awards - If Applicable

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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)  
([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)**

20

**Discussion**

Over the past 5 years, we have seen consistent numbers of AA (average: 4/yr)

- **AS-T**

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

98

**Discussion**

Over the past 5 years, we have seen an increase in the numbers of AS-T (average: 20) awards per year. There are about 5 times as many AS-T awarded as AA degrees.

## Student Enrollment Types

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### Student Enrollment Type: Day or Evening Student

- **Day: 4505 - 50.500%**  
**Program Average Headcount**  
507.000  
**Program Percentage of Total**  
51.500
- **Day & Evening: 2656 - 29.800%**  
**Program Average Headcount**  
402.000  
**Program Percentage of Total**  
40.800
- **Evening: 951 - 10.700%**  
**Program Average Headcount**  
57.000  
**Program Percentage of Total**  
5.700
- **Unknown: 807 - 9.000%**  
**Program Average Headcount**  
19.000  
**Program Percentage of Total**  
1.900

### Student Enrollment Type: Academic Load

- **Full Time: 2919 - 32.700%**  
**Program Average Headcount**  
438.000  
**Program Percentage of Total**  
44.300
- **Half Time or less than half time: 5843 - 65.500%**  
**Program Average Headcount**  
534.000  
**Program Percentage of Total**  
54.100
- **a. Discuss any changes in program enrollment types (day vs evening, full-time vs part-time) since your last program review?**

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).

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 than half-time 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%). This implies that while our program has grown, this growth has been mostly due to increased enrollment in part-time students.

The subtle shift in percentages with a slight increase in percent of day-only students within the biology program may be due to the overall lab class cap reduction from 28 to 25, or due to shifting student preference. 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.

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

Overall, the biology program serves more daytime students and fewer evening students compared to the rest of EVC. The program also has a higher percentage of full-time students than that of EVC on a whole (44.3% vs. 32.7% EVC-wide), and a lower percentage of half time or less than half time students (Biology = 54.1% while EVC = 65.5%).

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

The increase in part-time enrollments may be due to economic inflation and an increase in the overall cost of living, forcing more students to work part- or full-time while also attending school, or due to a loss of childcare during and post-pandemic. 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, participation in student clubs, etc.).

## Student Demographics - Headcount

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Student Demographic: Gender

- **Female: 4914 - 55.170%**

**Program Headcount**

635.000

**Program Percentage of Total**

64.630

- **Male: 3965 - 44.400%**

**Program Headcount**

344.000

**Program Percentage of Total**

35.090

- **No Value Entered: 38 - 0.430%**

**Program Headcount**

3.000

**Program Percentage of Total**

0.300

## Student Demographic: Age

- **17 & Below: 517 - 5.810%**

**Program Headcount**

26.000

**Program Percentage of Total**

2.650

- **18-24: 5364 - 60.090%**

**Program Headcount**

710.000

**Program Percentage of Total**

72.240

- **25-39: 2101 - 23.600%**

**Program Headcount**

213.000

**Program Percentage of Total**

21.750

- **40 & Over: 931 - 10.440%**

**Program Headcount**

33.000

**Program Percentage of Total**

3.360

- **Unknown: 6 - 0.060%**

**Program Headcount**

0.000

**Program Percentage of Total**

0.000

## Student Demographic: Race/Ethnicity (IPEDs Classification)

- 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?**

Enrollment in the biology courses at EVC has been greatly impacted by Covid. Enrollment started to decline as of the Fall 2020 semester, and it has continued to drop every semester up until Fall 2022. Economic uncertainties, loss of jobs, losing loved ones to Covid, caretaker responsibilities, lack of childcare, inflation, and general anxiety may have contributed to decreased enrollment.

The steepest drop in enrollment occurred in Spring 2022 (-19.46%) when the biology department began offering fully in-person labs. In Fall 2021, the department 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 10.3%. This decrease may be attributed to confusion and uncertainties for students who had grown accustomed to online teaching and online exams, as had been the practice of the biology department during lockdown. The biology program's decrease in enrollment is consistent with overall decreased enrollment at the college.

As of Fall 2022, the biology program has experienced a 12.47% increase in enrollment, a significant recovery.

- 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.**

Female students make up the majority of students enrolled in the biology program (65%), as well as of the campus more generally (55%). The majority of students in the biology program are ages 18-24 (72%), as is the case for the campus overall (60%). Asian students make up more than 43.6% of the enrollment in the biology program, compared to 40.8% for the campus. However, the percentage of Latinx (38.8%) students enrolled in the biology program is lower than the percentage enrolled at EVC overall (40.4%). The American Indian, African American, Hawaiian/Pacific Islander and white student population headcounts in the biology program are significantly lower than the Asian and Latinx student populations, which is consistent with overall EVC enrollment rates. Increased outreach events, efforts in community-building, and organizing structured biology field-related gatherings for students could improve enrollment for underrepresented populations.

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

As indicated in Section (b), enrollment in the biology program among Latinx students has been lower than that of enrollment at the college overall, and it needs to be improved. This gap in enrollment may be ameliorated through greater outreach to Latinx students enrolled at EVC and to prospective students from local high schools. Additionally, while enrollment rates of other diverse groups in the biology 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 biology program courses and at the college overall, and the disparity should be addressed.

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 biology at EVC, have the tools they need to feel empowered to pursue biology and are receiving adequate information regarding pre-

requisite courses offered at the high school level.

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

To improve 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 Tavara has compiled and drafted biographical information on several diverse scientists representing our diverse student population, 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 lack of funding for expansion.

Program growth and expansion require physical space and funding. A building to hold biology-related outreach events and gatherings, such as speaker series events from local biotech firms, conservation biologists, geneticists, ecologists, evolutionary biologists, botanists, and more, will introduce students to diverse areas in the field and potentially attract many students. The department can invite diverse speakers to encourage students of diverse backgrounds to pursue careers in biology. Currently, many students enrolled in the biology courses at EVC are pre-nursing students, a field that has traditionally attracted female students. Others are pursuing other health-related career goals, such as dental hygiene, physical therapy, and pharmacy. Such speaker events would expose students to additional career options beyond allied health and nursing and may help draw more male students to the biology program.

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. Currently, multiple spots on walls inside display cases in the museum are damaged due to a leaky roof that also damaged a few taxidermy specimens and there are other signs of maintenance neglect.

The biology department is in dire need of a designated storage room for its field trip equipment and supplies. Currently, camping gear (e.g., tents and tarps (sometimes wet), coolers, and stoves) are scattered about in the museum because of a lack of storage space. This makes the museum an unsafe and uninviting space for any current or potential students to visit and could potentially damage museum specimens due to humidity.

## Institutional Effectiveness (6.5 year average)

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EVC Capacity: 61.69% EVC Productivity: 14.27

### **Program Capacity**

78.24

### **Program Productivity**

15.66

**Is your capacity rate higher or lower then the campus?**

Our average capacity rate is 16.55% higher than the campus.

**Is your productivity goal higher or lower than the campus?**

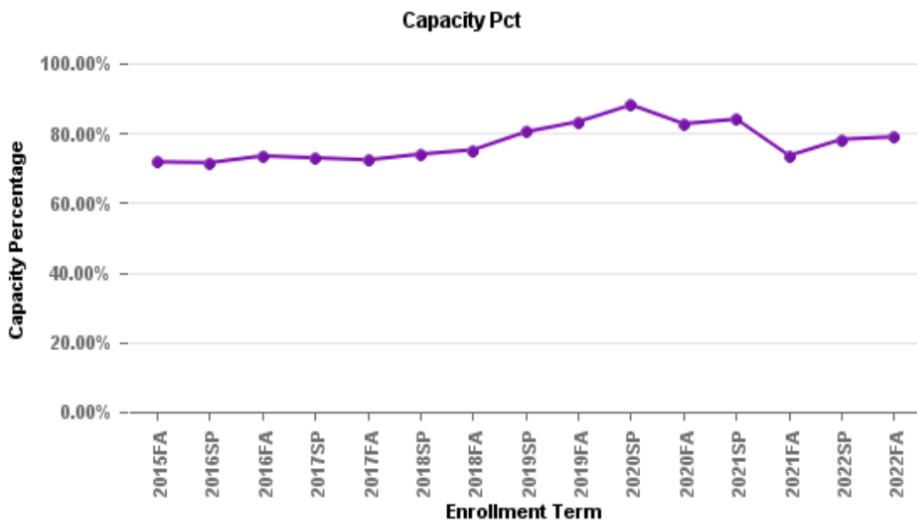
Our average productivity goal is 1.39 points higher than the campus.

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

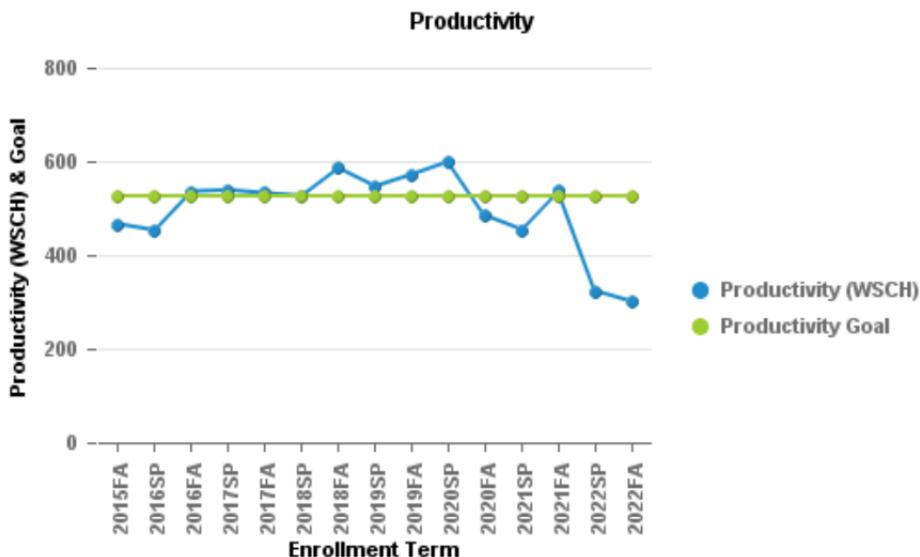
If the program capacity and/or productivity is lower than the campus, please provide rationale:

Our average program capacity and productivity are both higher than the campus values (2015 – 2022):

1. Capacity percentage at census date in the past 5 years (2015 – 2022):



2. Department productivity vs EVC goal for the past 5 years (2015 – 2022):



## Curriculum

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### Related Assessments

Biology AA PLOs 2023- Created: 09/11/2023 New PLO Assessment Report Originator: Jennifer Kurushima (/Form/Module/Index/3794)

BIOL 004A General Principles and Cell Biology - Fall 2023- Created: 10/26/2023 New Section Level SLO Assessment Report Originator: May Chen (/Form/Module/Index/5049)

004B Organismal Biology & Biodiversity- Created: 09/12/2023 New Section Level SLO Assessment Report Originator: Darcy Ernst (/Form/Module/Index/3802)

Biology AS-T PLOs 2023- Created: 09/14/2023 New PLO Assessment Report Originator: May Chen (/Form/Module/Index/3839)

BIOL 20 16-week 2023 - Created: 09/10/2023 New Section Level SLO Assessment Report Originator: Jennifer Kurushima (/Form/Module/Index/3792)

BIOL 20 All SLOs- Created: 10/25/2021 New Section Level SLO Assessment Report Originator: Jennifer Kurushima (/Form/Module/Index/1718)

Bio 061 Fall 2022- Created: 09/07/2023 New Section Level SLO Assessment Report Originator: Alfred Gonzalez (/Form/Module/Index/3767)

BIOL 062 Plants- Created: 09/04/2023 New Section Level SLO Assessment Report Originator: Lisa Hays (/Form/Module/Index/3736)

BIOL 063- Created: 10/23/2023 New Section Level SLO Assessment Report Originator: Sara Kappus (/Form/Module/Index/5047)

BIOL 063 Spring 2021- Created: 11/05/2021 New Section Level SLO Assessment Report Originator: Sara Kappus (/Form/Module/Index/1799)

064 Marine Biology- Created: 09/12/2023 New Section Level SLO Assessment Report Originator: Darcy Ernst (/Form/Module/Index/3801)

BIO 064- Created: 09/15/2023 New Section Level SLO Assessment Report Originator: Karen Moody (/Form/Module/Index/3866)

Wildlife Biology- Created: 09/15/2023 New Section Level SLO Assessment Report Originator: Karen Moody (/Form/Module/Index/3882)

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

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)

BIOL 080D Death Valley I24- Created: 02/29/2024 New Section Level SLO Assessment Report Originator: Lisa Pang (/Form/Module/Index/5320)

General Chemistry- Created: 03/01/2023 New Section Level SLO Assessment Report Originator: Bonnie Brown (/Form/Module/Index/3292)

CHEM 001A FA 2023- Created: 03/15/2024 New Section Level SLO Assessment Report Originator: Michael Ghebreab (/Form/Module/Index/5417)

CHEM 001B - General Chemistry Express the rate law using the initial rate study and calculate activation energy given rate vs. temperature data; recognize the relationship between the rate law and the reaction mechanism.- Created: 01/20/2022 New Section Level SLO Assessment Report Originator: Charles Chau (/Form/Module/Index/2162)

CHEM 001B- Created: 01/23/2022 New Section Level SLO Assessment Report Originator: Charles Chau (/Form/Module/Index/2167)

CHEM 012A- Created: 02/06/2023 New Section Level SLO Assessment Report Originator: Preeti Srinivasan (/Form/Module/Index/3153)

CHEM 012A Organic Chemistry- Created: 02/06/2023 New Section Level SLO Assessment Report Originator: Preeti Srinivasan (/Form/Module/Index/3156)

Environmental Science 10- Created: 02/28/2024 New Section Level SLO Assessment Report Originator: Alfred Gonzalez (/Form/Module/Index/5310)

ENVIR 010 Fall 2021- Created: 11/09/2021 New Section Level SLO Assessment Report Originator: Alfred Gonzalez (/Form/Module/Index/1828)

MATH 066-F23SLO Assessment- Created: 02/21/2024 New Section Level SLO Assessment Report Originator: Teck Ky (/Form/Module/Index/5303)

MATH066 F2021- Created: 03/20/2022 New Section Level SLO Assessment Report Originator: Teck Ky (/Form/Module/Index/2376)

Math067- Created: 11/23/2021 New Section Level SLO Assessment Report Originator: Teck Ky (/Form/Module/Index/1887)

MATH 071- Created: 09/13/2023 New Section Level SLO Assessment Report Originator: Tin Quach (/Form/Module/Index/3813)

MATH 072 - Calculus II with Analytic Geometry Evaluate definite, indefinite, and improper integrals using a variety of integration formulas and techniques. (C-ID objectives #1 and #3)- Created: 12/07/2021 New Section Level SLO Assessment Report Originator: Sithparran Vanniasegaram (/Form/Module/Index/1997)

Fall 2023 Math 072 Assessment- Created: 12/21/2023 New Section Level SLO Assessment Report Originator: Sithparran Vanniasegaram (/Form/Module/Index/5198)

Math 072 SLO Assessment- Created: 12/07/2021 New Section Level SLO Assessment Report Originator: Sithparran Vanniasegaram (/Form/Module/Index/2000)

PHYS 02A - Fa23\_new- Created: 01/01/2024 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/5220)

PHYS 02A- Created: 12/31/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/5214)

PHYS 2A f23- Created: 03/15/2024 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/5406)

PHYS 2A - spr23- Created: 08/26/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/3689)

Phys 2A- Created: 01/01/2022 New Section Level SLO Assessment Report Originator: Michael Masuda (/Form/Module/Index/2077)

Phys 2A- Created: 06/06/2022 New Section Level SLO Assessment Report Originator: Michael Masuda (/Form/Module/Index/2602)

Phys 2A- Created: 10/20/2021 New Section Level SLO Assessment Report Originator: Michael Masuda (/Form/Module/Index/1667)

PHYS 02B Fa23- Created: 12/31/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/5215)

PHYS 002B- Created: 02/26/2022 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/2292)

PHYS 2B spr23- Created: 08/26/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/3690)

PHYS 004A- Created: 01/02/2022 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/2078)

PHYS 4A - SPR 22- Created: 06/09/2022 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/2626)

Phys 4A- Created: 10/20/2021 New Section Level SLO Assessment Report Originator: Michael Masuda (/Form/Module/Index/1668)  
PHYS 4B- Created: 10/18/2021 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/1621)  
PHYS 004B SPR 22- Created: 02/27/2022 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/2295)  
PHYS 4B- Created: 10/16/2021 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/1604)  
Phys 4B- Created: 01/02/2022 New Section Level SLO Assessment Report Originator: Michael Masuda (/Form/Module/Index/2079)  
PHYS 07A- Created: 01/02/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/3074)  
PHYS 07A - FA23- Created: 12/21/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/5196)  
PHYS 07A spr23- Created: 08/26/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/3693)  
PHYS 07B Fa23- Created: 12/31/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/5213)  
PHYS 07B spr23- Created: 08/27/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/3694)

### **Courses in the program**

BIOL 004A - General Principles and Cell Biology - Active. Implemented on May 26 2023 12:00AM (/Form/Course/index/5344)  
BIOL 004B - Organismal Biology and Biodiversity - Active. Implemented on May 26 2023 12:00AM (/Form/Course/index/5343)  
CHEM 001A - General Chemistry - Active. Implemented on Sep 27 2021 12:00AM (/Form/Course/index/4280)  
MATH 071 - Calculus I with Analytic Geometry - Active. Implemented on Oct 4 2022 12:00AM (/Form/Course/index/4871)  
PHYS 002A - Algebra/Trigonometry-Based Physics I - Active. Implemented on Mar 7 2022 12:00AM (/Form/Course/index/3784)  
PHYS 002B - Algebra/Trigonometry-Based Physics II - Active. Implemented on Jan 19 2021 12:00AM (/Form/Course/index/3785)  
BIOL 020 - Human Biology - Active. Implemented on Oct 19 2021 12:00AM (/Form/Course/index/4480)  
BIOL 061 - Human Heredity - Active. Implemented on Mar 16 2023 12:00AM (/Form/Course/index/4375)  
BIOL 062 - Plants and Human Welfare - Active. Implemented on Feb 24 2023 12:00AM (/Form/Course/index/5185)  
BIOL 063 - Ecology - Active. Implemented on Jan 11 2021 12:00AM (/Form/Course/index/3911)  
BIOL 064 - Marine Biology - Active. Implemented on Feb 28 2023 12:00AM (/Form/Course/index/4873)  
BIOL 065 - Wildlife Biology - Active. Implemented on Mar 16 2023 12:00AM (/Form/Course/index/4374)  
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)  
BIOL 080C - Field Biology - Coastal California - Active. Implemented on Sep 25 2023 12:00AM (/Form/Course/index/5300)  
ENVIR 010 - Environmental Science - Active. Implemented on Jan 11 2021 12:00AM (/Form/Course/index/3901)  
BIOL 004A - General Principles and Cell Biology - Active. Implemented on May 26 2023 12:00AM (/Form/Course/index/5344)

BIOL 004B - Organismal Biology and Biodiversity - Active. Implemented on May 26 2023 12:00AM (/Form/Course/index/5343)

CHEM 001A - General Chemistry - Active. Implemented on Sep 27 2021 12:00AM (/Form/Course/index/4280)

CHEM 001B - General Chemistry - Active. Implemented on Sep 27 2021 12:00AM (/Form/Course/index/4278)

CHEM 012A - Organic Chemistry - Active. Implemented on Jul 23 2020 12:00AM (/Form/Course/index/3973)

CHEM 012B - Organic Chemistry - Active. Implemented on Jul 23 2020 12:00AM (/Form/Course/index/3974)

MATH 063 - Elementary Statistics - Active. Implemented on Mar 17 2024 12:00AM (/Form/Course/index/5502)

MATH 071 - Calculus I with Analytic Geometry - Active. Implemented on Oct 4 2022 12:00AM (/Form/Course/index/4871)

MATH 072 - Calculus II with Analytic Geometry - Active. Implemented on Jul 23 2020 12:00AM (/Form/Course/index/3870)

MATH 066 - Calculus I Late Transcendentals for STEM - Active. Implemented on Oct 5 2021 12:00AM (/Form/Course/index/4402)

PHYS 004A - General Physics - Active. Implemented on Jan 25 2021 12:00AM (/Form/Course/index/4303)

PHYS 004B - General Physics - Active. Implemented on Jan 21 2021 12:00AM (/Form/Course/index/4312)

BIOL 080D - Field Biology - Desert and Dunes - Active. Implemented on Sep 25 2023 12:00AM (/Form/Course/index/5301)

BIOL 080F - Field Biology - Forest and River Ecology - Active. Implemented on Sep 26 2023 12:00AM (/Form/Course/index/5302)

BIOL 080G - Field Biology - Volcanoes of California - Active. Implemented on Oct 16 2023 12:00AM (/Form/Course/index/5303)

PHYS 007A - Calculus - Based General Physics for Scientists and Engineers - I - Active. Implemented on Sep 28 2021 12:00AM (/Form/Course/index/3840)

PHYS 007B - Calculus-Based General Physics for Scientists and Engineers - II - Active. Implemented on Sep 28 2021 12:00AM (/Form/Course/index/3856)

CHEM 001B - General Chemistry - Active. Implemented on Sep 27 2021 12:00AM (/Form/Course/index/4278)

MATH 066 - Calculus I Late Transcendentals for STEM - Active. Implemented on Oct 5 2021 12:00AM (/Form/Course/index/4402)

MATH 067 - Calculus II Late Transcendentals for STEM - Active. Implemented on Jan 11 2021 12:00AM (/Form/Course/index/4197)

- 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. Of the twenty-three courses listed, 15 have been updated or revised since the last program review. The remaining 8 courses (highlighted) are new courses. 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	Intersession	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 AST Biology Program Map (60.0 - 61.0 Units)

Fall Term 1	Spring Term 2	Fall Term 3	Spring Term 4
Chem 15	Chem 1A	Chem 1B	Bio 4B
Phys 2A	Math 66/71	Bio 4A	Area C2
Eng 1A	Phys 2B	Area D	Area D
Area E	Area A1	Area A3	Area F
			Transferable elective (1 unit)

Table B.3b AA Biology Program Map (63.0 Units)

Fall Term 1	Spring Term 2	Fall Term 3	Spring Term 4
Chem 15	Chem 1A	Chem 1B	Bio 4B
Envir 10	Major Elective	Bio 4A	Area C2
Eng 1A	US History	Math 063	US History

Area E	Area A1	Area A3	Area F
Area C1	Physical Activity		

- 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 21, Biol 4A, Biol 4B), several other courses have faculty that have created free materials for students (Biol 71, Biol 21), and several faculty applications for creation of OER have been funded by the office of the president over the last two years. An Ecology (Biol 63) OER textbook was written by Sara Kappus and two OER resources (a lab manual and instructor resource guide) were written for Biol 4A and 4B by May Chen, Darcy Ernst, Katie Folz, and Bridget Greuel.

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.

In the BIOL 80 series we have incorporated more interaction with researchers and state and federal agency employees. This has provided insight to the ecology of the areas we visit and the possible careers available in associated disciplines. This has also led to more opportunities for locations and possibly decreased cost as the National Park Service grants free camping when school groups are involved in NPS education programs in some parks.

A future hope for the BIOL 80 series is to develop a volunteer program where former students can volunteer to assist in the course allowing them to revisit locations and provide valuable assistance to the instructors and further support for the program on campus and in the local community. 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 online and hybrid 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.**

The biology program does not require external accreditation or certification.

## Student Learning Outcome and Assessment

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### Related Assessments

Biology AA PLOs 2023- Created: 09/11/2023 New PLO Assessment Report Originator: Jennifer Kurushima (/Form/Module/Index/3794)

BIOL 004A General Principles and Cell Biology - Fall 2023- Created: 10/26/2023 New Section Level SLO Assessment Report Originator: May Chen (/Form/Module/Index/5049)

004B Organismal Biology & Biodiversity- Created: 09/12/2023 New Section Level SLO Assessment Report Originator: Darcy Ernst (/Form/Module/Index/3802)

Biology AS-T PLOs 2023- Created: 09/14/2023 New PLO Assessment Report Originator: May Chen (/Form/Module/Index/3839)

BIOL 20 16-week 2023 - Created: 09/10/2023 New Section Level SLO Assessment Report Originator: Jennifer Kurushima (/Form/Module/Index/3792)

BIOL 20 All SLOs- Created: 10/25/2021 New Section Level SLO Assessment Report Originator: Jennifer Kurushima (/Form/Module/Index/1718)

Bio 061 Fall 2022- Created: 09/07/2023 New Section Level SLO Assessment Report Originator: Alfred Gonzalez (/Form/Module/Index/3767)

BIOL 062 Plants- Created: 09/04/2023 New Section Level SLO Assessment Report Originator: Lisa Hays (/Form/Module/Index/3736)

BIOL 063- Created: 10/23/2023 New Section Level SLO Assessment Report Originator: Sara Kappus (/Form/Module/Index/5047)

BIOL 063 Spring 2021- Created: 11/05/2021 New Section Level SLO Assessment Report Originator: Sara Kappus (/Form/Module/Index/1799)

064 Marine Biology- Created: 09/12/2023 New Section Level SLO Assessment Report Originator: Darcy Ernst (/Form/Module/Index/3801)

BIO 064- Created: 09/15/2023 New Section Level SLO Assessment Report Originator: Karen Moody (/Form/Module/Index/3866)

Wildlife Biology- Created: 09/15/2023 New Section Level SLO Assessment Report Originator: Karen Moody (/Form/Module/Index/3882)

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

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)

BIOL 080D Death Valley I24- Created: 02/29/2024 New Section Level SLO Assessment Report Originator: Lisa Pang (/Form/Module/Index/5320)

General Chemistry- Created: 03/01/2023 New Section Level SLO Assessment Report Originator: Bonnie Brown (/Form/Module/Index/3292)

CHEM 001A FA 2023- Created: 03/15/2024 New Section Level SLO Assessment Report Originator: Michael Ghebreab (/Form/Module/Index/5417)

CHEM 001B - General Chemistry Express the rate law using the initial rate study and calculate activation energy given rate vs. temperature data; recognize the relationship between the rate law and the reaction

mechanism.- Created: 01/20/2022 New Section Level SLO Assessment Report Originator: Charles Chau (/Form/Module/Index/2162)

CHEM 001B- Created: 01/23/2022 New Section Level SLO Assessment Report Originator: Charles Chau (/Form/Module/Index/2167)

CHEM 012A- Created: 02/06/2023 New Section Level SLO Assessment Report Originator: Preeti Srinivasan (/Form/Module/Index/3153)

CHEM 012A Organic Chemistry- Created: 02/06/2023 New Section Level SLO Assessment Report Originator: Preeti Srinivasan (/Form/Module/Index/3156)

Environmental Science 10- Created: 02/28/2024 New Section Level SLO Assessment Report Originator: Alfred Gonzalez (/Form/Module/Index/5310)

ENVIR 010 Fall 2021- Created: 11/09/2021 New Section Level SLO Assessment Report Originator: Alfred Gonzalez (/Form/Module/Index/1828)

MATH 066-F23SLO Assessment- Created: 02/21/2024 New Section Level SLO Assessment Report Originator: Teck Ky (/Form/Module/Index/5303)

MATH066 F2021- Created: 03/20/2022 New Section Level SLO Assessment Report Originator: Teck Ky (/Form/Module/Index/2376)

Math067- Created: 11/23/2021 New Section Level SLO Assessment Report Originator: Teck Ky (/Form/Module/Index/1887)

MATH 071- Created: 09/13/2023 New Section Level SLO Assessment Report Originator: Tin Quach (/Form/Module/Index/3813)

MATH 072 - Calculus II with Analytic Geometry Evaluate definite, indefinite, and improper integrals using a variety of integration formulas and techniques. (C-ID objectives #1 and #3)- Created: 12/07/2021 New Section Level SLO Assessment Report Originator: Sithparran Vanniasegaram (/Form/Module/Index/1997)

Fall 2023 Math 072 Assessment- Created: 12/21/2023 New Section Level SLO Assessment Report Originator: Sithparran Vanniasegaram (/Form/Module/Index/5198)

Math 072 SLO Assessment- Created: 12/07/2021 New Section Level SLO Assessment Report Originator: Sithparran Vanniasegaram (/Form/Module/Index/2000)

PHYS 02A - Fa23\_new- Created: 01/01/2024 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/5220)

PHYS 02A- Created: 12/31/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/5214)

PHYS 2A f23- Created: 03/15/2024 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/5406)

PHYS 2A - spr23- Created: 08/26/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/3689)

Phys 2A- Created: 01/01/2022 New Section Level SLO Assessment Report Originator: Michael Masuda (/Form/Module/Index/2077)

Phys 2A- Created: 06/06/2022 New Section Level SLO Assessment Report Originator: Michael Masuda (/Form/Module/Index/2602)

Phys 2A- Created: 10/20/2021 New Section Level SLO Assessment Report Originator: Michael Masuda (/Form/Module/Index/1667)

PHYS 02B Fa23- Created: 12/31/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/5215)

PHYS 002B- Created: 02/26/2022 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/2292)

PHYS 2B spr23- Created: 08/26/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/3690)

PHYS 004A- Created: 01/02/2022 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/2078)

PHYS 4A - SPR 22- Created: 06/09/2022 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/2626)

Phys 4A- Created: 10/20/2021 New Section Level SLO Assessment Report Originator: Michael Masuda (/Form/Module/Index/1668)

PHYS 4B- Created: 10/18/2021 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/1621)

PHYS 004B SPR 22- Created: 02/27/2022 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/2295)

PHYS 4B- Created: 10/16/2021 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/1604)

Phys 4B- Created: 01/02/2022 New Section Level SLO Assessment Report Originator: Michael Masuda (/Form/Module/Index/2079)

PHYS 07A- Created: 01/02/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/3074)

PHYS 07A - FA23- Created: 12/21/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/5196)

PHYS 07A spr23- Created: 08/26/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/3693)

PHYS 07B Fa23- Created: 12/31/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/5213)

PHYS 07B spr23- Created: 08/27/2023 New Section Level SLO Assessment Report Originator: Celso Batalha (/Form/Module/Index/3694)

### **Student Learning Outcomes**

BIOL 004A - General Principles and Cell Biology - Assess, evaluate, and debate fundamental principles and concepts, and new findings and ideas in biology by using scientific literature. (Active)

BIOL 004A - General Principles and Cell Biology - Describe, illustrate, and compare prokaryotic and eukaryotic cell form and function, biological molecules, metabolism, communication, and modes of cell reproduction. (Active)

BIOL 004A - General Principles and Cell Biology - Explain and compare Mendelian, chromosomal, and elementary molecular genetics, and cell and molecular processes in evolution. (Active)

BIOL 004A - General Principles and Cell Biology - Use the scientific method to formulate and test hypotheses and related predictions, design experimental tests, and evaluate data. (Active)

BIOL 004A - General Principles and Cell Biology - Use current, industry-level scientific instruments and/or discipline-specific computer hardware and software to measure experimental outcomes, collect and organize biological data, and present results through scientific writing or presentations. (Active)

BIOL 004B - Organismal Biology and Biodiversity - Apply the scientific method, including hypothesis formulation, experimental design and prediction, analysis and presentation of data, and the development of conclusions supported by data, to phylogenetic analysis and the study of the diversity of organisms. (Active)

BIOL 004B - Organismal Biology and Biodiversity - Demonstrate proficiency in standard biological techniques, using industry-level biology laboratory equipment and/or discipline-specific computer hardware and software. (Active)

BIOL 004B - Organismal Biology and Biodiversity - Conduct a research project and effectively communicate experimental results. (Active)

BIOL 004B - Organismal Biology and Biodiversity - Explain and apply principles and processes of evolution, ecology, and physiology at different organizational levels, from the organismal to the ecological. (Active)

BIOL 020 - Human Biology - Apply the scientific method to evaluate current scientific research on human health dilemmas in the popular press. (Active)

- BIOL 020 - Human Biology - Apply the scientific method to evaluate current scientific research on human health dilemmas in the popular press. (Active)
- BIOL 020 - Human Biology - Compare and contrast the cell structures of prokaryotes and various eukaryotes (including humans). (Active)
- BIOL 020 - Human Biology - Compare and contrast the cell structures of prokaryotes and various eukaryotes (including humans). (Active)
- BIOL 020 - Human Biology - Relate the forms and functions of selected human organ systems to homeostasis at the organismal level. (Active)
- BIOL 020 - Human Biology - Relate the forms and functions of selected human organ systems to homeostasis at the organismal level. (Active)
- BIOL 020 - Human Biology - Describe the theory of evolution by natural selection and explain how it unifies all living things and accounts for human diversity. (Active)
- BIOL 020 - Human Biology - Describe the theory of evolution by natural selection and explain how it unifies all living things and accounts for human diversity. (Active)
- BIOL 020 - Human Biology - Describe how humans and organisms interact with their environments and explain the unique relationship and responsibility which humans bear towards their environment. (Active)
- BIOL 020 - Human Biology - Describe how humans and organisms interact with their environments and explain the unique relationship and responsibility which humans bear towards their environment. (Active)
- BIOL 061 - Human Heredity - Describe the scientific method using basic statistics and explain how it can be applied to the study of human heredity and the role of animal models and twin studies. (Active)
- BIOL 061 - Human Heredity - Deduce the pattern of inheritance for a genetic trait, and determine the potential risk to an individual of either inheriting or passing the trait on to their offspring. (Active)
- BIOL 061 - Human Heredity - Identify common causes of mutations, and describe the effects of different types of mutations (substitution, insertion, deletion, frameshift, and nucleotide repeats) and chromosomal abnormalities (polyploidy, aneuploidy, inversion, deletion, expansion, and translocation). (Active)
- BIOL 061 - Human Heredity - Evaluate the medical, psychological, and legal consequences of genetic testing and screening, and the bioethical issues that have emerged with advances in biotechnology, and the role(s) of genetic counseling. (Active)
- BIOL 061 - Human Heredity - Relate genotype and phenotype to allele and phenotypic frequencies in populations utilizing the Hardy-Weinberg law. Also, analyze the consequences of violating the Hardy-Weinberg assumptions for populations, and explain how these concepts relate to human origin, evolution, and diversity. (Active)
- BIOL 062 - Plants and Human Welfare - Identify, compare, and contrast the anatomical structures of different types of plants, algae and fungi. (Active)
- BIOL 062 - Plants and Human Welfare - Differentiate the ways that people use plants, including as food, medicine, recreation, clothing and building materials. (Active)
- BIOL 062 - Plants and Human Welfare - Analyze the advantages and disadvantages of growing genetically modified plants around the world. (Active)
- BIOL 063 - Ecology - Identify important biotic and abiotic factors, trophic structure and roles, and key biogeochemical cycles in the biosphere. (Active)
- BIOL 063 - Ecology - Identify important biotic and abiotic factors, trophic structure and roles, and key biogeochemical cycles in the biosphere. (Historical)
- BIOL 063 - Ecology - Identify important biotic and abiotic factors, trophic structure and roles, and key biogeochemical cycles in the biosphere. (Active)
- BIOL 063 - Ecology - Evaluate biological populations and the factors that influence their distributions, patterns of growth, and evolution. (Active)
- BIOL 063 - Ecology - Evaluate biological populations and the factors that influence their distributions, patterns of growth, and evolution. (Historical)

- BIOL 063 - Ecology - Evaluate biological populations and the factors that influence their distributions, patterns of growth, and evolution. (Active)
- BIOL 063 - Ecology - Compare ecological systems and anthropogenic effects such as pollution and introduced species on those systems. (Active)
- BIOL 063 - Ecology - Compare ecological systems and anthropogenic effects such as pollution and introduced species on those systems. (Historical)
- BIOL 063 - Ecology - Compare ecological systems and anthropogenic effects such as pollution and introduced species on those systems. (Active)
- BIOL 063 - Ecology - Compare primary and secondary ecological succession, and be able to identify and describe examples of each. (Active)
- BIOL 063 - Ecology - Compare primary and secondary ecological succession, and be able to identify and describe examples of each. (Historical)
- BIOL 063 - Ecology - Compare primary and secondary ecological succession, and be able to identify and describe examples of each. (Active)
- BIOL 063 - Ecology - Describe and critique approaches to preserve or conserve ecosystems, and to regulate and mitigate their exploitation. (Active)
- BIOL 063 - Ecology - Describe and critique approaches to preserve or conserve ecosystems, and to regulate and mitigate their exploitation. (Historical)
- BIOL 063 - Ecology - Describe and critique approaches to preserve or conserve ecosystems, and to regulate and mitigate their exploitation. (Active)
- BIOL 064 - Marine Biology - Explain how abiotic physical, chemical and geological factors in ocean and estuarine systems determine the distribution and zonation of marine organisms. (Active)
- BIOL 064 - Marine Biology - Describe recurring patterns of interactions between organisms in different marine habitats, including kelp forests, rocky, sandy and muddy shorelines, coral reefs, estuaries, pelagic ocean, and deep sea. (Active)
- BIOL 064 - Marine Biology - Use the scientific method to investigate the biological characteristics and relationships among and between marine plankton, algae, plants, invertebrates, and vertebrates, including humans. (Active)
- BIOL 065 - Wildlife Biology - Describe wildlife issues that can and or may affect national, regional and local political activities. (Active)
- BIOL 065 - Wildlife Biology - Explain and relate how human activities have accelerated the rate at which wildlife becomes threatened, endangered or extinct, and how humans can develop species value through alternative lifestyles and social expectations. (Active)
- BIOL 065 - Wildlife Biology - Explain and identify wildlife requirements, abiotic & biotic resources and their function within the ecological system. (Active)
- 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)

BIOL 080D - Field Biology - Desert and Dunes - Explain the ecology of the ecosystem they visit, including associated communities. (Active)

BIOL 080D - Field Biology - Desert and Dunes - Summarize the human and geological history of the area and how that affects the biological community. (Active)

BIOL 080D - Field Biology - Desert and Dunes - Properly and safely prepare for camping and hiking in the ecosystem visited, and demonstrate the correct application of the tenets of Leave No Trace. (Active)

CHEM 001A - General Chemistry - Distinguish between ionic vs. covalent compounds, write names and chemical formulas, and classify and balance chemical reactions. (In Review)

CHEM 001A - General Chemistry - Distinguish between ionic vs. covalent compounds, write names and chemical formulas, and classify and balance chemical reactions. (Active)

CHEM 001A - General Chemistry - Distinguish between ionic vs. covalent compounds, write names and chemical formulas, and classify and balance chemical reactions. (Historical)

CHEM 001A - General Chemistry - Distinguish between ionic vs. covalent compounds, write names and chemical formulas, and classify and balance chemical reactions. (Historical)

CHEM 001A - General Chemistry - Distinguish between ionic vs. covalent compounds, write names and chemical formulas, and classify and balance chemical reactions. (Historical)

CHEM 001A - General Chemistry - Distinguish between ionic vs. covalent compounds, write names and chemical formulas, and classify and balance chemical reactions. (Active)

CHEM 001A - General Chemistry - Interpret chemical reactions occurring in the macroscopic world using microscopic principles, and recognize quantitative relationships from balanced chemical equations. (Active)

CHEM 001A - General Chemistry - Interpret chemical reactions occurring in the macroscopic world using microscopic principles, and recognize quantitative relationships from balanced chemical equations. (Historical)

CHEM 001A - General Chemistry - Interpret chemical reactions occurring in the macroscopic world using microscopic principles, and recognize quantitative relationships from balanced chemical equations. (Historical)

CHEM 001A - General Chemistry - Interpret chemical reactions occurring in the macroscopic world using microscopic principles, and recognize quantitative relationships from balanced chemical equations.

(Historical)

CHEM 001A - General Chemistry - Interpret chemical reactions occurring in the macroscopic world using microscopic principles, and recognize quantitative relationships from balanced chemical equations. (Active)

CHEM 001A - General Chemistry - Interpret chemical reactions occurring in the macroscopic world using microscopic principles, and recognize quantitative relationships from balanced chemical equations. (In Review)

CHEM 001A - General Chemistry - Describe gaseous behavior using the Kinetic Molecular Theory as a theoretical model and use this model to solve problems. (In Review)

CHEM 001A - General Chemistry - Describe gaseous behavior using the Kinetic Molecular Theory as a theoretical model and use this model to solve problems. (Active)

CHEM 001A - General Chemistry - Describe gaseous behavior using the Kinetic Molecular Theory as a theoretical model and use this model to solve problems. (Historical)

CHEM 001A - General Chemistry - Describe gaseous behavior using the Kinetic Molecular Theory as a theoretical model and use this model to solve problems. (Historical)

CHEM 001A - General Chemistry - Describe gaseous behavior using the Kinetic Molecular Theory as a theoretical model and use this model to solve problems. (Active)

CHEM 001A - General Chemistry - Describe gaseous behavior using the Kinetic Molecular Theory as a theoretical model and use this model to solve problems. (Historical)

CHEM 001A - General Chemistry - Correlate the properties of liquids, solids, and solutions with molecular geometry and intermolecular interactions. (Historical)

CHEM 001A - General Chemistry - Correlate the properties of liquids, solids, and solutions with molecular geometry and intermolecular interactions. (Active)

CHEM 001A - General Chemistry - Correlate the properties of liquids, solids, and solutions with molecular geometry and intermolecular interactions. (Historical)

CHEM 001A - General Chemistry - Correlate the properties of liquids, solids, and solutions with molecular geometry and intermolecular interactions. (Historical)

CHEM 001A - General Chemistry - Correlate the properties of liquids, solids, and solutions with molecular geometry and intermolecular interactions. (Active)

CHEM 001A - General Chemistry - Correlate the properties of liquids, solids, and solutions with molecular geometry and intermolecular interactions. (In Review)

CHEM 001A - General Chemistry - Use technology, including computers and the web, to analyze atomic and molecular structure. (In Review)

CHEM 001A - General Chemistry - Use technology, including computers and the web, to analyze atomic and molecular structure. (Active)

CHEM 001A - General Chemistry - Use technology, including computers and the web, to analyze atomic and molecular structure. (Historical)

CHEM 001A - General Chemistry - Use technology, including computers and the web, to analyze atomic and molecular structure. (Historical)

CHEM 001A - General Chemistry - Use technology, including computers and the web, to analyze atomic and molecular structure. (Active)

CHEM 001A - General Chemistry - Use technology, including computers and the web, to analyze atomic and molecular structure. (Historical)

CHEM 001B - General Chemistry - Express the rate law using the initial rate study and calculate activation energy given rate vs. temperature data; recognize the relationship between the rate law and the reaction mechanism. (Historical)

CHEM 001B - General Chemistry - Express the rate law using the initial rate study and calculate activation energy given rate vs. temperature data; recognize the relationship between the rate law and the reaction mechanism. (Rejected)

CHEM 001B - General Chemistry - Express the rate law using the initial rate study and calculate activation energy given rate vs. temperature data; recognize the relationship between the rate law and the reaction mechanism. (Active)

CHEM 001B - General Chemistry - Express the rate law using the initial rate study and calculate activation energy given rate vs. temperature data; recognize the relationship between the rate law and the reaction mechanism. (Historical)

CHEM 001B - General Chemistry - Recognize the concept of chemical equilibrium according to Le Chatelier's principle and apply the concept to aqueous systems such as acid-base, precipitation, and complex ions to analyze unknowns using inductive and deductive reasoning. (Historical)

CHEM 001B - General Chemistry - Recognize the concept of chemical equilibrium according to Le Chatelier's principle and apply the concept to aqueous systems such as acid-base, precipitation, and complex ions to analyze unknowns using inductive and deductive reasoning. (Active)

CHEM 001B - General Chemistry - Recognize the concept of chemical equilibrium according to Le Chatelier's principle and apply the concept to aqueous systems such as acid-base, precipitation, and complex ions to analyze unknowns using inductive and deductive reasoning. (Rejected)

CHEM 001B - General Chemistry - Recognize the concept of chemical equilibrium according to Le Chatelier's principle and apply the concept to aqueous systems such as acid-base, precipitation, and complex ions to analyze unknowns using inductive and deductive reasoning. (Historical)

CHEM 001B - General Chemistry - Predict the spontaneity of chemical reactions using the Second Law of Thermodynamics (entropy and Gibbs free energy) and apply the Second Law of Thermodynamics to voltaic cells and electrolytic cells. (Historical)

CHEM 001B - General Chemistry - Predict the spontaneity of chemical reactions using the Second Law of Thermodynamics (entropy and Gibbs free energy) and apply the Second Law of Thermodynamics to voltaic cells and electrolytic cells. (Rejected)

CHEM 001B - General Chemistry - Predict the spontaneity of chemical reactions using the Second Law of Thermodynamics (entropy and Gibbs free energy) and apply the Second Law of Thermodynamics to voltaic cells and electrolytic cells. (Active)

CHEM 001B - General Chemistry - Predict the spontaneity of chemical reactions using the Second Law of Thermodynamics (entropy and Gibbs free energy) and apply the Second Law of Thermodynamics to voltaic cells and electrolytic cells. (Historical)

CHEM 001B - General Chemistry - Describe the bonding theories of coordination compounds and their chemical behavior. (Historical)

CHEM 001B - General Chemistry - Describe the bonding theories of coordination compounds and their chemical behavior. (Active)

CHEM 001B - General Chemistry - Describe the bonding theories of coordination compounds and their chemical behavior. (Rejected)

CHEM 001B - General Chemistry - Describe the bonding theories of coordination compounds and their chemical behavior. (Historical)

CHEM 001B - General Chemistry - Describe nuclear disintegration processes and explain their nuclear behavior. (Historical)

CHEM 001B - General Chemistry - Describe nuclear disintegration processes and explain their nuclear behavior. (Rejected)

CHEM 001B - General Chemistry - Describe nuclear disintegration processes and explain their nuclear behavior. (Active)

CHEM 001B - General Chemistry - Describe nuclear disintegration processes and explain their nuclear behavior. (Historical)

CHEM 001B - General Chemistry - Classify organic molecules according to functional groups and structures, and summarize their main chemical reactions. (Historical)

CHEM 001B - General Chemistry - Classify organic molecules according to functional groups and structures, and summarize their main chemical reactions. (Active)

CHEM 001B - General Chemistry - Classify organic molecules according to functional groups and structures, and summarize their main chemical reactions. (Rejected)

CHEM 001B - General Chemistry - Classify organic molecules according to functional groups and structures, and summarize their main chemical reactions. (Historical)

CHEM 012A - Organic Chemistry - Employ the scientific methods of testing, observing, and drawing conclusions through inductive and deductive reasoning (Historical)

CHEM 012A - Organic Chemistry - Employ the scientific methods of testing, observing, and drawing conclusions through inductive and deductive reasoning (Historical)

CHEM 012A - Organic Chemistry - Employ the scientific methods of testing, observing, and drawing conclusions through inductive and deductive reasoning (Historical)

CHEM 012A - Organic Chemistry - Employ the scientific methods of testing, observing, and drawing conclusions through inductive and deductive reasoning (Rejected)

CHEM 012A - Organic Chemistry - Employ the scientific methods of testing, observing, and drawing conclusions through inductive and deductive reasoning (Historical)

CHEM 012A - Organic Chemistry - Employ the scientific methods of testing, observing, and drawing conclusions through inductive and deductive reasoning (Active)

CHEM 012A - Organic Chemistry - Apply the 3-D nature of organic molecules to study major organic reactions including descriptions of reaction kinetics, mechanisms, and stereochemistry of products. (Active)

CHEM 012A - Organic Chemistry - Apply the 3-D nature of organic molecules to study major organic reactions including descriptions of reaction kinetics, mechanisms, and stereochemistry of products. (Historical)

CHEM 012A - Organic Chemistry - Apply the 3-D nature of organic molecules to study major organic reactions including descriptions of reaction kinetics, mechanisms, and stereochemistry of products. (Rejected)

CHEM 012A - Organic Chemistry - Apply the 3-D nature of organic molecules to study major organic reactions including descriptions of reaction kinetics, mechanisms, and stereochemistry of products. (Historical)

CHEM 012A - Organic Chemistry - Apply the 3-D nature of organic molecules to study major organic reactions including descriptions of reaction kinetics, mechanisms, and stereochemistry of products. (Historical)

CHEM 012A - Organic Chemistry - Apply the 3-D nature of organic molecules to study major organic reactions including descriptions of reaction kinetics, mechanisms, and stereochemistry of products. (Historical)

CHEM 012A - Organic Chemistry - Describe the theoretical and experimental aspects of common organic laboratory techniques for separation, purification, and compound characterization (Historical)

CHEM 012A - Organic Chemistry - Describe the theoretical and experimental aspects of common organic laboratory techniques for separation, purification, and compound characterization (Historical)

CHEM 012A - Organic Chemistry - Describe the theoretical and experimental aspects of common organic laboratory techniques for separation, purification, and compound characterization (Historical)

CHEM 012A - Organic Chemistry - Describe the theoretical and experimental aspects of common organic laboratory techniques for separation, purification, and compound characterization (Rejected)

CHEM 012A - Organic Chemistry - Describe the theoretical and experimental aspects of common organic laboratory techniques for separation, purification, and compound characterization (Historical)

CHEM 012A - Organic Chemistry - Describe the theoretical and experimental aspects of common organic laboratory techniques for separation, purification, and compound characterization (Active)

CHEM 012A - Organic Chemistry - Compare and contrast major classes of organic compounds in their physical and chemical properties by application of bonding theories, intermolecular forces, steric, and electronic forces (Active)

CHEM 012A - Organic Chemistry - Compare and contrast major classes of organic compounds in their physical and chemical properties by application of bonding theories, intermolecular forces, steric, and electronic forces (Historical)

CHEM 012A - Organic Chemistry - Compare and contrast major classes of organic compounds in their physical and chemical properties by application of bonding theories, intermolecular forces, steric, and electronic forces (Rejected)

CHEM 012A - Organic Chemistry - Compare and contrast major classes of organic compounds in their physical and chemical properties by application of bonding theories, intermolecular forces, steric, and electronic forces (Historical)

CHEM 012A - Organic Chemistry - Compare and contrast major classes of organic compounds in their physical and chemical properties by application of bonding theories, intermolecular forces, steric, and electronic forces (Historical)

CHEM 012A - Organic Chemistry - Compare and contrast major classes of organic compounds in their physical and chemical properties by application of bonding theories, intermolecular forces, steric, and electronic forces (Historical)

CHEM 012A - Organic Chemistry - Apply physical spectroscopic theories and laboratory techniques for compound elucidation. (Historical)

CHEM 012A - Organic Chemistry - Apply physical spectroscopic theories and laboratory techniques for compound elucidation. (Historical)

CHEM 012A - Organic Chemistry - Apply physical spectroscopic theories and laboratory techniques for compound elucidation. (Historical)

CHEM 012A - Organic Chemistry - Apply physical spectroscopic theories and laboratory techniques for compound elucidation. (Rejected)

CHEM 012A - Organic Chemistry - Apply physical spectroscopic theories and laboratory techniques for compound elucidation. (Historical)

CHEM 012A - Organic Chemistry - Apply physical spectroscopic theories and laboratory techniques for compound elucidation. (Active)

CHEM 012B - Organic Chemistry - Employ the scientific methods of testing, observing, and drawing conclusions through inductive and deductive reasoning in synthesis and spectroscopy experiments (Historical)

CHEM 012B - Organic Chemistry - Employ the scientific methods of testing, observing, and drawing conclusions through inductive and deductive reasoning in synthesis and spectroscopy experiments (Historical)

CHEM 012B - Organic Chemistry - Employ the scientific methods of testing, observing, and drawing conclusions through inductive and deductive reasoning in synthesis and spectroscopy experiments (Active)

CHEM 012B - Organic Chemistry - Employ the scientific methods of testing, observing, and drawing conclusions through inductive and deductive reasoning in synthesis and spectroscopy experiments (Historical)

CHEM 012B - Organic Chemistry - Apply the 3-D nature of organic molecules to study major organic reactions for alcohols, ketones, aldehydes, carboxylic acids, and their derivatives including descriptions of reaction kinetics, mechanisms, and stereochemistry of products (Historical)

CHEM 012B - Organic Chemistry - Apply the 3-D nature of organic molecules to study major organic reactions for alcohols, ketones, aldehydes, carboxylic acids, and their derivatives including descriptions of reaction kinetics, mechanisms, and stereochemistry of products (Active)

CHEM 012B - Organic Chemistry - Apply the 3-D nature of organic molecules to study major organic reactions for alcohols, ketones, aldehydes, carboxylic acids, and their derivatives including descriptions of reaction kinetics, mechanisms, and stereochemistry of products (Historical)

CHEM 012B - Organic Chemistry - Apply the 3-D nature of organic molecules to study major organic reactions for alcohols, ketones, aldehydes, carboxylic acids, and their derivatives including descriptions of reaction kinetics, mechanisms, and stereochemistry of products (Historical)

CHEM 012B - Organic Chemistry - Compare and contrast major classes of organic compounds such as alcohols, ketones, aldehydes, carboxylic acids, and their derivatives in their physical and chemical properties

by application of bonding theories, intermolecular forces, steric, and electronic forces (Historical)

CHEM 012B - Organic Chemistry - Compare and contrast major classes of organic compounds such as alcohols, ketones, aldehydes, carboxylic acids, and their derivatives in their physical and chemical properties by application of bonding theories, intermolecular forces, steric, and electronic forces (Historical)

CHEM 012B - Organic Chemistry - Compare and contrast major classes of organic compounds such as alcohols, ketones, aldehydes, carboxylic acids, and their derivatives in their physical and chemical properties by application of bonding theories, intermolecular forces, steric, and electronic forces (Active)

CHEM 012B - Organic Chemistry - Compare and contrast major classes of organic compounds such as alcohols, ketones, aldehydes, carboxylic acids, and their derivatives in their physical and chemical properties by application of bonding theories, intermolecular forces, steric, and electronic forces (Historical)

CHEM 012B - Organic Chemistry - Apply physical spectroscopic theories and laboratory techniques for compound elucidation including alcohols, ketones, aldehydes, carboxylic acids, and their derivatives (Historical)

CHEM 012B - Organic Chemistry - Apply physical spectroscopic theories and laboratory techniques for compound elucidation including alcohols, ketones, aldehydes, carboxylic acids, and their derivatives (Active)

CHEM 012B - Organic Chemistry - Apply physical spectroscopic theories and laboratory techniques for compound elucidation including alcohols, ketones, aldehydes, carboxylic acids, and their derivatives (Historical)

CHEM 012B - Organic Chemistry - Apply physical spectroscopic theories and laboratory techniques for compound elucidation including alcohols, ketones, aldehydes, carboxylic acids, and their derivatives (Historical)

CHEM 012B - Organic Chemistry - Relate organic reactions of functional groups in the design and synthesis of more complex systems including polyesters, polyamides, and polypeptides (Historical)

CHEM 012B - Organic Chemistry - Relate organic reactions of functional groups in the design and synthesis of more complex systems including polyesters, polyamides, and polypeptides (Historical)

CHEM 012B - Organic Chemistry - Relate organic reactions of functional groups in the design and synthesis of more complex systems including polyesters, polyamides, and polypeptides (Active)

CHEM 012B - Organic Chemistry - Relate organic reactions of functional groups in the design and synthesis of more complex systems including polyesters, polyamides, and polypeptides (Historical)

ENVIR 010 - Environmental Science - Evaluate the differences between scientific and non-scientific approaches to environmental questions using basic principles of the scientific method. (Active)

ENVIR 010 - Environmental Science - Evaluate the differences between scientific and non-scientific approaches to environmental questions using basic principles of the scientific method. (Active)

ENVIR 010 - Environmental Science - Assess threats to the environment and human health resulting from air, water, and land pollution, and describe waste-management strategies for each. (Active)

ENVIR 010 - Environmental Science - Assess threats to the environment and human health resulting from air, water, and land pollution, and describe waste-management strategies for each. (Active)

ENVIR 010 - Environmental Science - Compare and contrast world agricultural practices, including modern-industrial methods, subsistence-level cultivation, and sustainable practices with respect to their relative efficiencies and their impacts on soil, water, and air resources, and on human health. (Active)

ENVIR 010 - Environmental Science - Compare and contrast world agricultural practices, including modern-industrial methods, subsistence-level cultivation, and sustainable practices with respect to their relative efficiencies and their impacts on soil, water, and air resources, and on human health. (Active)

ENVIR 010 - Environmental Science - Describe and evaluate the environmental and socioeconomic costs and benefits of exploiting renewable and non-renewable resources. (Active)

ENVIR 010 - Environmental Science - Describe and evaluate the environmental and socioeconomic costs and benefits of exploiting renewable and non-renewable resources. (Active)

ENVIR 010 - Environmental Science - Identify and explain the likely environmental and socioeconomic effects of continued growth in human population and consumption, global climate change, decreasing biodiversity,

and appropriate responses to these challenges in education, law, and social policies and practices. (Active)

ENVR 010 - Environmental Science - Identify and explain the likely environmental and socioeconomic effects of continued growth in human population and consumption, global climate change, decreasing biodiversity, and appropriate responses to these challenges in education, law, and social policies and practices. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Compute and interpret limits of a function using analytic and other techniques when they exist; when limits do not exist, give reasons why for their non-existence. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Compute and interpret limits of a function using analytic and other techniques when they exist; when limits do not exist, give reasons why for their non-existence. (Rejected)

MATH 066 - Calculus I Late Transcendentals for STEM - Compute and interpret limits of a function using analytic and other techniques when they exist; when limits do not exist, give reasons why for their non-existence. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Compute derivatives using limit, differentiation formulas, and implicit differentiation. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Compute derivatives using limit, differentiation formulas, and implicit differentiation. (Rejected)

MATH 066 - Calculus I Late Transcendentals for STEM - Compute derivatives using limit, differentiation formulas, and implicit differentiation. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Apply the definition of continuity to determine whether or not a function is continuous at a real number. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Apply the definition of continuity to determine whether or not a function is continuous at a real number. (Rejected)

MATH 066 - Calculus I Late Transcendentals for STEM - Apply the definition of continuity to determine whether or not a function is continuous at a real number. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Apply differential calculus to sketch the graph of a function, to obtain the equation of the tangent line to a function, and to solve applications such as optimization and related rate problems. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Apply differential calculus to sketch the graph of a function, to obtain the equation of the tangent line to a function, and to solve applications such as optimization and related rate problems. (Rejected)

MATH 066 - Calculus I Late Transcendentals for STEM - Apply differential calculus to sketch the graph of a function, to obtain the equation of the tangent line to a function, and to solve applications such as optimization and related rate problems. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Evaluate the definite integral using the limit of Riemann Sum, and using the Fundamental Theorem of Calculus. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Evaluate the definite integral using the limit of Riemann Sum, and using the Fundamental Theorem of Calculus. (Rejected)

MATH 066 - Calculus I Late Transcendentals for STEM - Evaluate the definite integral using the limit of Riemann Sum, and using the Fundamental Theorem of Calculus. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Use the definite integral to find areas and volumes. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Use the definite integral to find areas and volumes. (Rejected)

MATH 066 - Calculus I Late Transcendentals for STEM - Use the definite integral to find areas and volumes. (Active)

MATH 067 - Calculus II Late Transcendentals for STEM - Evaluate definite, indefinite, and improper integrals using a variety of integration formulas and techniques. (Active)

MATH 067 - Calculus II Late Transcendentals for STEM - Evaluate definite, indefinite, and improper integrals using a variety of integration formulas and techniques. (Historical)

MATH 067 - Calculus II Late Transcendentals for STEM - Find the derivative of transcendental functions. (Historical)

MATH 067 - Calculus II Late Transcendentals for STEM - Find the derivative of transcendental functions. (Active)

MATH 067 - Calculus II Late Transcendentals for STEM - Evaluate indeterminate forms using l'Hospital's Rule. (Active)

MATH 067 - Calculus II Late Transcendentals for STEM - Evaluate indeterminate forms using l'Hospital's Rule. (Historical)

MATH 067 - Calculus II Late Transcendentals for STEM - Apply integrals and differential equations to problems such as volumes, arc length of a curve, area of a surface of revolution, center of mass, and population dynamics. (Historical)

MATH 067 - Calculus II Late Transcendentals for STEM - Apply integrals and differential equations to problems such as volumes, arc length of a curve, area of a surface of revolution, center of mass, and population dynamics. (Active)

MATH 067 - Calculus II Late Transcendentals for STEM - Apply divergence and convergence tests to sequences and series, and represent functions as power series using different techniques including the Taylor theorem. (Active)

MATH 067 - Calculus II Late Transcendentals for STEM - Apply divergence and convergence tests to sequences and series, and represent functions as power series using different techniques including the Taylor theorem. (Historical)

MATH 067 - Calculus II Late Transcendentals for STEM - Graph and analyze functions in polar and parametric forms, and solve problems by differentiating and integrating such functions. (Historical)

MATH 067 - Calculus II Late Transcendentals for STEM - Graph and analyze functions in polar and parametric forms, and solve problems by differentiating and integrating such functions. (Active)

MATH 071 - Calculus I with Analytic Geometry - Compute and interpret limits of a function using analytic and other techniques when they exist; when limits do not exist, give reasons why for their non-existence. (Active)

MATH 071 - Calculus I with Analytic Geometry - Apply the definition of continuity in terms of limits to analyze the behavior of functions at a point, and explain why the function may not be continuous at a given point. (Active)

MATH 071 - Calculus I with Analytic Geometry - Compute the derivative of various functions using both the definition of a derivative of a function in terms of limits and differentiation formulas including implicit differentiation. (Active)

MATH 071 - Calculus I with Analytic Geometry - Apply differential calculus to the sketching of the graph of a function, to obtain the equation of the tangent line to a function, to optimization and related rate problems, and to applications from science, engineering, and economics. (Active)

MATH 071 - Calculus I with Analytic Geometry - Define and compute the definite integral as a limit of a Riemann sum to determine the area under the graph of a function, and evaluate definite integrals using the Fundamental Theorem of Calculus. (Active)

MATH 071 - Calculus I with Analytic Geometry - Apply integration to find area. (Active)

MATH 072 - Calculus II with Analytic Geometry - Evaluate definite, indefinite, and improper integrals using a variety of integration formulas and techniques. (Active)

MATH 072 - Calculus II with Analytic Geometry - Evaluate definite, indefinite, and improper integrals using a variety of integration formulas and techniques. (Active)

MATH 072 - Calculus II with Analytic Geometry - Evaluate definite, indefinite, and improper integrals using a variety of integration formulas and techniques. (Rejected)

MATH 072 - Calculus II with Analytic Geometry - Evaluate definite, indefinite, and improper integrals using a variety of integration formulas and techniques. (Historical)

- MATH 072 - Calculus II with Analytic Geometry - Evaluate definite, indefinite, and improper integrals using a variety of integration formulas and techniques. (Historical)
- MATH 072 - Calculus II with Analytic Geometry - Apply integrals and differential equations to problems such as areas, volumes, arc lengths, work, and population dynamics. (Historical)
- MATH 072 - Calculus II with Analytic Geometry - Apply integrals and differential equations to problems such as areas, volumes, arc lengths, work, and population dynamics. (Historical)
- MATH 072 - Calculus II with Analytic Geometry - Apply integrals and differential equations to problems such as areas, volumes, arc lengths, work, and population dynamics. (Rejected)
- MATH 072 - Calculus II with Analytic Geometry - Apply integrals and differential equations to problems such as areas, volumes, arc lengths, work, and population dynamics. (Active)
- MATH 072 - Calculus II with Analytic Geometry - Apply integrals and differential equations to problems such as areas, volumes, arc lengths, work, and population dynamics. (Active)
- MATH 072 - Calculus II with Analytic Geometry - Graph and analyze functions in polar and parametric forms, and solve problems by differentiating and integrating such functions. (Active)
- MATH 072 - Calculus II with Analytic Geometry - Graph and analyze functions in polar and parametric forms, and solve problems by differentiating and integrating such functions. (Rejected)
- MATH 072 - Calculus II with Analytic Geometry - Graph and analyze functions in polar and parametric forms, and solve problems by differentiating and integrating such functions. (Historical)
- MATH 072 - Calculus II with Analytic Geometry - Graph and analyze functions in polar and parametric forms, and solve problems by differentiating and integrating such functions. (Historical)
- MATH 072 - Calculus II with Analytic Geometry - Graph and analyze functions in polar and parametric forms, and solve problems by differentiating and integrating such functions. (Active)
- MATH 072 - Calculus II with Analytic Geometry - Apply divergence or convergence tests to sequences and series, and represent functions as power series using different techniques including the Taylor theorem. (Historical)
- MATH 072 - Calculus II with Analytic Geometry - Apply divergence or convergence tests to sequences and series, and represent functions as power series using different techniques including the Taylor theorem. (Historical)
- MATH 072 - Calculus II with Analytic Geometry - Apply divergence or convergence tests to sequences and series, and represent functions as power series using different techniques including the Taylor theorem. (Rejected)
- MATH 072 - Calculus II with Analytic Geometry - Apply divergence or convergence tests to sequences and series, and represent functions as power series using different techniques including the Taylor theorem. (Active)
- MATH 072 - Calculus II with Analytic Geometry - Apply divergence or convergence tests to sequences and series, and represent functions as power series using different techniques including the Taylor theorem. (Active)
- PHYS 002A - Algebra/Trigonometry-Based Physics I - Apply kinematic equations to predict the motion of a uniformly accelerated object. (Active)
- PHYS 002A - Algebra/Trigonometry-Based Physics I - Apply kinematic equations to predict the motion of a uniformly accelerated object. (Active)
- PHYS 002A - Algebra/Trigonometry-Based Physics I - Apply kinematic equations to predict the motion of a uniformly accelerated object. (Active)
- PHYS 002A - Algebra/Trigonometry-Based Physics I - Apply kinematic equations to predict the motion of a uniformly accelerated object. (Historical)
- PHYS 002A - Algebra/Trigonometry-Based Physics I - Apply kinematic equations to predict the motion of a uniformly accelerated object. (Draft)
- PHYS 002A - Algebra/Trigonometry-Based Physics I - Apply kinematic equations to predict the motion of a uniformly accelerated object. (Draft)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Apply kinematic equations to predict the motion of a uniformly accelerated object. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Apply Newton's laws of motion to solve problems involving multiple forces acting on an object. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Apply Newton's laws of motion to solve problems involving multiple forces acting on an object. (Draft)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Apply Newton's laws of motion to solve problems involving multiple forces acting on an object. (Draft)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Apply Newton's laws of motion to solve problems involving multiple forces acting on an object. (Historical)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Apply Newton's laws of motion to solve problems involving multiple forces acting on an object. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Apply Newton's laws of motion to solve problems involving multiple forces acting on an object. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Apply Newton's laws of motion to solve problems involving multiple forces acting on an object. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Formulate and solve mechanics and thermodynamics problems using the laws of conservation of energy and momentum. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Formulate and solve mechanics and thermodynamics problems using the laws of conservation of energy and momentum. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Formulate and solve mechanics and thermodynamics problems using the laws of conservation of energy and momentum. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Formulate and solve mechanics and thermodynamics problems using the laws of conservation of energy and momentum. (Historical)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Formulate and solve mechanics and thermodynamics problems using the laws of conservation of energy and momentum. (Draft)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Formulate and solve mechanics and thermodynamics problems using the laws of conservation of energy and momentum. (Draft)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Formulate and solve mechanics and thermodynamics problems using the laws of conservation of energy and momentum. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Present experimental findings in a scientific manner, using critical thinking and logic. (Draft)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Present experimental findings in a scientific manner, using critical thinking and logic. (Draft)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Present experimental findings in a scientific manner, using critical thinking and logic. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Present experimental findings in a scientific manner, using critical thinking and logic. (Historical)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Present experimental findings in a scientific manner, using critical thinking and logic. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Present experimental findings in a scientific manner, using critical thinking and logic. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Present experimental findings in a scientific manner, using critical thinking and logic. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Analyze static and rotating systems using concepts of torque and angular acceleration. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Analyze static and rotating systems using concepts of torque and angular acceleration. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Analyze static and rotating systems using concepts of torque and angular acceleration. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Analyze static and rotating systems using concepts of torque and angular acceleration. (Historical)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Analyze static and rotating systems using concepts of torque and angular acceleration. (Draft)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Analyze static and rotating systems using concepts of torque and angular acceleration. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Analyze static and rotating systems using concepts of torque and angular acceleration. (Draft)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Estimate error propagation on data collected in lab, using appropriate units and consistent number of significant figures. (Draft)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Estimate error propagation on data collected in lab, using appropriate units and consistent number of significant figures. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Estimate error propagation on data collected in lab, using appropriate units and consistent number of significant figures. (Draft)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Estimate error propagation on data collected in lab, using appropriate units and consistent number of significant figures. (Historical)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Estimate error propagation on data collected in lab, using appropriate units and consistent number of significant figures. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Estimate error propagation on data collected in lab, using appropriate units and consistent number of significant figures. (Active)

PHYS 002A - Algebra/Trigonometry-Based Physics I - Estimate error propagation on data collected in lab, using appropriate units and consistent number of significant figures. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Calculate the electric field and electric potential produced by a simple distribution of charges. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Calculate the electric field and electric potential produced by a simple distribution of charges. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Calculate the electric field and electric potential produced by a simple distribution of charges. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Calculate magnetic fields produced by simple distribution of current carrying wires. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Calculate magnetic fields produced by simple distribution of current carrying wires. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Calculate magnetic fields produced by simple distribution of current carrying wires. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Determine the trajectory of a charged particle moving in a region permeated by electric and magnetic fields. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Determine the trajectory of a charged particle moving in a region permeated by electric and magnetic fields. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Determine the trajectory of a charged particle moving in a region permeated by electric and magnetic fields. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Calculate voltages, currents, and power dissipated in different components of AC/DC circuits. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Calculate voltages, currents, and power dissipated in different components of AC/DC circuits. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Calculate voltages, currents, and power dissipated in different components of AC/DC circuits. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Calculate location and size of images formed by mirrors and lenses. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Calculate location and size of images formed by mirrors and lenses. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Calculate location and size of images formed by mirrors and lenses. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Analyze the phenomena of interference and diffraction in optics, and predict patterns produced by different types of slits. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Analyze the phenomena of interference and diffraction in optics, and predict patterns produced by different types of slits. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Analyze the phenomena of interference and diffraction in optics, and predict patterns produced by different types of slits. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Discuss how Quantum Mechanics and Relativity changed our views of the natural world. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Discuss how Quantum Mechanics and Relativity changed our views of the natural world. (Active)

PHYS 002B - Algebra/Trigonometry-Based Physics II - Discuss how Quantum Mechanics and Relativity changed our views of the natural world. (Active)

PHYS 004A - General Physics - Solve problems involving accelerated motion using equations of kinematics. (Active)

PHYS 004A - General Physics - Solve problems involving accelerated motion using equations of kinematics. (Active)

PHYS 004A - General Physics - Solve problems involving accelerated motion using equations of kinematics. (Active)

PHYS 004A - General Physics - Predict the position and velocity of an object if all external forces acting on it are known. (Active)

PHYS 004A - General Physics - Predict the position and velocity of an object if all external forces acting on it are known. (Active)

PHYS 004A - General Physics - Predict the position and velocity of an object if all external forces acting on it are known. (Active)

PHYS 004A - General Physics - Predict the position and speed of an object subjected to conservative and non-conservative forces. (Active)

PHYS 004A - General Physics - Predict the position and speed of an object subjected to conservative and non-conservative forces. (Active)

PHYS 004A - General Physics - Predict the position and speed of an object subjected to conservative and non-conservative forces. (Active)

PHYS 004A - General Physics - Analyze the motion of rolling and spinning masses. (Active)

PHYS 004A - General Physics - Analyze the motion of rolling and spinning masses. (Active)

PHYS 004A - General Physics - Analyze the motion of rolling and spinning masses. (Active)

PHYS 004A - General Physics - Employ the principle of the harmonic oscillator to solve more complex systems such as vibrating molecules. (Active)

PHYS 004A - General Physics - Employ the principle of the harmonic oscillator to solve more complex systems such as vibrating molecules. (Active)

PHYS 004A - General Physics - Employ the principle of the harmonic oscillator to solve more complex systems such as vibrating molecules. (Active)

PHYS 004A - General Physics - Apply the concepts of gravitational force and potential energy to predict the trajectory of objects. (Active)

PHYS 004A - General Physics - Apply the concepts of gravitational force and potential energy to predict the trajectory of objects. (Active)

- PHYS 004A - General Physics - Apply the concepts of gravitational force and potential energy to predict the trajectory of objects. (Active)
- PHYS 004A - General Physics - Apply Archimedes law to calculate the fraction of a floating object partially submerged. (Active)
- PHYS 004A - General Physics - Apply Archimedes law to calculate the fraction of a floating object partially submerged. (Active)
- PHYS 004A - General Physics - Apply Archimedes law to calculate the fraction of a floating object partially submerged. (Active)
- PHYS 004B - General Physics - Solve real world problems involving electricity and magnetism. (Active)
- PHYS 004B - General Physics - Solve real world problems involving electricity and magnetism. (Historical)
- PHYS 004B - General Physics - Solve real world problems involving electricity and magnetism. (Rejected)
- PHYS 004B - General Physics - Solve real world problems involving electricity and magnetism. (Active)
- PHYS 004B - General Physics - Solve real world problems involving electricity and magnetism. (Active)
- PHYS 004B - General Physics - Calculate electric fields and electric potentials produced by simple charge distributions. (Active)
- PHYS 004B - General Physics - Calculate electric fields and electric potentials produced by simple charge distributions. (Active)
- PHYS 004B - General Physics - Calculate electric fields and electric potentials produced by simple charge distributions. (Rejected)
- PHYS 004B - General Physics - Calculate electric fields and electric potentials produced by simple charge distributions. (Historical)
- PHYS 004B - General Physics - Calculate electric fields and electric potentials produced by simple charge distributions. (Active)
- PHYS 004B - General Physics - Apply the principle of conservation of energy to determine the trajectory of a charge moving in an electric and magnetic fields. (Active)
- PHYS 004B - General Physics - Apply the principle of conservation of energy to determine the trajectory of a charge moving in an electric and magnetic fields. (Historical)
- PHYS 004B - General Physics - Apply the principle of conservation of energy to determine the trajectory of a charge moving in an electric and magnetic fields. (Rejected)
- PHYS 004B - General Physics - Apply the principle of conservation of energy to determine the trajectory of a charge moving in an electric and magnetic fields. (Active)
- PHYS 004B - General Physics - Apply the principle of conservation of energy to determine the trajectory of a charge moving in an electric and magnetic fields. (Active)
- PHYS 004B - General Physics - Determine voltages, currents, and power dissipated in different components of an AC/DC circuit. (Active)
- PHYS 004B - General Physics - Determine voltages, currents, and power dissipated in different components of an AC/DC circuit. (Active)
- PHYS 004B - General Physics - Determine voltages, currents, and power dissipated in different components of an AC/DC circuit. (Rejected)
- PHYS 004B - General Physics - Determine voltages, currents, and power dissipated in different components of an AC/DC circuit. (Historical)
- PHYS 004B - General Physics - Determine voltages, currents, and power dissipated in different components of an AC/DC circuit. (Active)
- PHYS 004B - General Physics - Calculate the induced voltage generated by simple distributions of varying currents and moving magnets. (Active)
- PHYS 004B - General Physics - Calculate the induced voltage generated by simple distributions of varying currents and moving magnets. (Historical)
- PHYS 004B - General Physics - Calculate the induced voltage generated by simple distributions of varying currents and moving magnets. (Rejected)

PHYS 004B - General Physics - Calculate the induced voltage generated by simple distributions of varying currents and moving magnets. (Active)

PHYS 004B - General Physics - Calculate the induced voltage generated by simple distributions of varying currents and moving magnets. (Active)

PHYS 007A - Calculus - Based General Physics for Scientists and Engineers - I - Predict the position and velocity of an object moving through space and subject to a range of conservative and nonconservative forces. (Active)

PHYS 007A - Calculus - Based General Physics for Scientists and Engineers - I - Predict the position and velocity of an object moving through space and subject to a range of conservative and nonconservative forces. (Active)

PHYS 007A - Calculus - Based General Physics for Scientists and Engineers - I - Predict the dynamic evolution of a system subject to an arrangement of conservative and nonconservative forces. (Active)

PHYS 007A - Calculus - Based General Physics for Scientists and Engineers - I - Predict the dynamic evolution of a system subject to an arrangement of conservative and nonconservative forces. (Active)

PHYS 007A - Calculus - Based General Physics for Scientists and Engineers - I - Report the uncertainties of physical quantities unveiled in lab exercises, with special care on displaying reasonable number of significant figures. (Active)

PHYS 007A - Calculus - Based General Physics for Scientists and Engineers - I - Report the uncertainties of physical quantities unveiled in lab exercises, with special care on displaying reasonable number of significant figures. (Active)

PHYS 007A - Calculus - Based General Physics for Scientists and Engineers - I - Apply the principles of work, energy and momentum conservation in situations involving the motion of bodies in two or three dimensions, in interacting spinning systems, and in fluid dynamics. (Active)

PHYS 007A - Calculus - Based General Physics for Scientists and Engineers - I - Apply the principles of work, energy and momentum conservation in situations involving the motion of bodies in two or three dimensions, in interacting spinning systems, and in fluid dynamics. (Active)

PHYS 007A - Calculus - Based General Physics for Scientists and Engineers - I - Develop an original project that illustrates principles or laws of classical mechanics, including public presentation of such project. (Active)

PHYS 007A - Calculus - Based General Physics for Scientists and Engineers - I - Develop an original project that illustrates principles or laws of classical mechanics, including public presentation of such project. (Active)

PHYS 007B - Calculus-Based General Physics for Scientists and Engineers - II - Measure the electric field lines produced by simple distribution of charges. (Active)

PHYS 007B - Calculus-Based General Physics for Scientists and Engineers - II - Measure the electric field lines produced by simple distribution of charges. (Active)

PHYS 007B - Calculus-Based General Physics for Scientists and Engineers - II - Use a calculus-based approach to determine the electric field of various charge distributions, making use of Gauss's Laws, if suitable. (Active)

PHYS 007B - Calculus-Based General Physics for Scientists and Engineers - II - Use a calculus-based approach to determine the electric field of various charge distributions, making use of Gauss's Laws, if suitable. (Active)

PHYS 007B - Calculus-Based General Physics for Scientists and Engineers - II - Use a calculus-based approach to determine the magnetic field of current carrying wires, making use of Ampere's Laws, if suitable. (Active)

PHYS 007B - Calculus-Based General Physics for Scientists and Engineers - II - Use a calculus-based approach to determine the magnetic field of current carrying wires, making use of Ampere's Laws, if suitable. (Active)

PHYS 007B - Calculus-Based General Physics for Scientists and Engineers - II - Predict the motion of charged particles subjected to electric and/or magnetic fields. (Active)

PHYS 007B - Calculus-Based General Physics for Scientists and Engineers - II - Predict the motion of charged particles subjected to electric and/or magnetic fields. (Active)

PHYS 007B - Calculus-Based General Physics for Scientists and Engineers - II - Analyze AC and DC circuits containing an assortment of inductors, resistances, capacitors, and power supplies. (Active)

PHYS 007B - Calculus-Based General Physics for Scientists and Engineers - II - Analyze AC and DC circuits containing an assortment of inductors, resistances, capacitors, and power supplies. (Active)

PHYS 007B - Calculus-Based General Physics for Scientists and Engineers - II - Use error propagation methods to determine the uncertainties of measured quantities. (Active)

PHYS 007B - Calculus-Based General Physics for Scientists and Engineers - II - Use error propagation methods to determine the uncertainties of measured quantities. (Active)

### Program Learning Outcomes

Biology - Associate in Arts: Associate in Arts - Employ the scientific method in the design, implementation, data collection, and analysis of experiments or observational studies. (Active)

Biology - Associate in Arts: Associate in Arts - Practice current or industry-standard laboratory techniques and lab safety procedures. (Active)

Biology - Associate in Arts: Associate in Arts - Explain scientific concepts and processes from levels ranging from biochemical to ecological. (Active)

Biology - Associate in Science for Transfer: Associate in Science for Transfer - Design, conduct, analyze, and/or report the results of investigations and experiments in the laboratory and/or field. (Active)

Biology - Associate in Science for Transfer: Associate in Science for Transfer - Explain and apply basic principles and processes of biology from the biochemical level to the ecological level. (Active)

Biology - Associate in Science for Transfer: Associate in Science for Transfer - Practice current or industry-standard biology laboratory techniques and lab safety procedures. (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.**

### Biology 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.
- 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 004A: Use the scientific method to formulate and test hypotheses and related predictions, design experimental tests, and evaluate data.
- The PLO is introduced, developed and practiced in the course.

- BIOL 004B: Apply the scientific method, including hypothesis formulation, experimental design and prediction, analysis and presentation of data, and the development of conclusions supported by data, to phylogenetic analysis and the study of the diversity of organisms.
- The PLO is introduced, developed, and practiced in the course.

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

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.
- 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 004A: Use scientific instruments to measure experimental outcomes, collect and organize biological data, and present results through scientific writing or presentations.
- The PLO is introduced, developed and practiced, and 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.
- 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 004A: Describe, illustrate, and compare prokaryotic and eukaryotic cell form and function, biological molecules, metabolism, communication, and modes of cell reproduction.
- The PLO is introduced, developed and practiced in the course.
- BIOL 004B: Compare and contrast the basic anatomy, physiology, and life cycles, and the distinctive characteristics of organisms representative of major taxonomic groups.
- The PLO is introduced, developed and practiced in the course
- CHEM 001A: Correlate the properties of liquids, solids, and solutions with molecular geometry and intermolecular interactions.
- The PLO is introduced, mastered and measured in the course.
- CHEM 001B: Predict the spontaneity of chemical reactions using the Second Law of Thermodynamics (entropy and Gibbs free energy) and apply the Second Law of Thermodynamics to voltaic cells and electrolytic cells.
- The PLO is introduced, mastered and measured in the course.

## Biology AS-T

PLO1: Design, conduct, analyze, and/or report the results of investigations and experiments in the laboratory and/or field.

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.

SLO's mapped to this PLO:

- BIOL 004A: Use the scientific method to formulate and test hypotheses and related predictions, design experimental tests, and evaluate data.
- The PLO is introduced and is mastered and measured in the course
- BIOL 004A: Use scientific instruments to measure experimental outcomes, collect and organize biological data, and present results through scientific writing or presentations.
- The PLO is introduced and is mastered and measured in the course
- BIOL 004B: Apply the scientific method, including hypothesis formulation, experimental design and prediction, analysis and presentation of data, and the development of conclusions supported by data, to phylogenetic analysis and the study of the diversity of organisms.
- The PLO is introduced and is developed and practiced in the course
- CHEM 001A: Use technology, including computers and the web, to analyze atomic and molecular structure.
- The PLO is introduced and is mastered and measured in the course
- MATH 071: Apply differential calculus to the sketching of the graph of a function, to obtain the equation of the tangent line to a function, to optimization and related rate problems, and to applications from science, engineering, and economics.
- The PLO is introduced and is mastered and measured in the course
- PHYS 002A: Present experimental findings in a scientific manner, using critical thinking and logic. (all C-ID)
- The PLO is introduced and is mastered and measured in the course
- PHYS 002A: Collect, and analyze experimental data using appropriate units, significant figures, and estimating error propagation. (all C-ID)
- The PLO is introduced and is mastered and measured in the course
- PHYS 004B: Solve real world problems involving electricity and magnetism.

- The PLO is introduced, is developed and practiced in the course, and is mastered and measured in the course

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

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.
- 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 004A: Assess, evaluate, and debate fundamental principles and concepts, and new findings and ideas in biology by using scientific literature.
- The PLO is introduced, mastered and measured in the course.
- BIOL 004A: Describe, illustrate, and compare prokaryotic and eukaryotic cell form and function, biological molecules, metabolism, communication, and modes of cell reproduction.
- The PLO is introduced, mastered and measured in the course.
- BIOL 004A: Explain and compare Mendelian, chromosomal, and elementary molecular genetics, and cell and molecular processes in evolution.
- The PLO is introduced, mastered and measured in the course.
- BIOL 004B: Compare and contrast the basic anatomy, physiology, and life cycles, and the distinctive characteristics of organisms representative of major taxonomic groups.
- The PLO is introduced, developed and practiced in the course.
- BIOL 004B: Construct and evaluate the phylogenetic relationships among major taxonomic groups.
- The PLO is introduced, developed and practiced in the course
- BIOL 004B: Relate the emergence and diversification of major taxonomic groups to prevailing conditions during Earth's history, and to the impacts of mass extinctions and adaptive radiations.
- The PLO is introduced, developed and practiced in the course.
- BIOL 004B: Evaluate the relationships among organisms and their environments incorporating ecological and evolutionary principles including the concepts of niche and adaptation.
- The PLO is introduced, developed and practiced in the course.
- BIOL 004B: Apply the scientific method, including hypothesis formulation, experimental design and prediction, analysis and presentation of data, and the development of conclusions supported by data, to phylogenetic analysis and the study of the diversity of organisms.
- The PLO is introduced, developed and practiced in the course.

PLO 3: Explain and apply basic principles and processes of biology from the biochemical level to the ecological level.

Mapped to the following ILO's:

- Communication: The student will demonstrate effective communication, appropriate to the audience and purpose.
- 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 004A: Use scientific instruments to measure experimental outcomes, collect and organize biological data, and present results through scientific writing or presentations.
  - The PLO is introduced, mastered and measured in the course.
  - BIOL 004B: Apply the scientific method, including hypothesis formulation, experimental design and prediction, analysis and presentation of data, and the development of conclusions supported by data, to phylogenetic analysis and the study of the diversity of organisms.
  - 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 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.

Courses like General Biology (BIOL 21), major's series biology (BIOL 4A and 4B), Marine Biology (BIOL 64), Wildlife Biology (BIOL 65), and Environmental Science (ENVIR 10) would all benefit from higher quality samples to observe in lab. Learning about the various taxa of plants and animals requires a diversity of fresh samples.

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.

To address both the need for fresh samples and increase opportunities for student designed inquiry we need to (1) repair and maintain the department greenhouse to allow us to grow and maintain plants and fungi, (2) develop an outdoor garden of native and hard to find species in the planting areas adjacent to S-112, S-113, and the faculty offices, (3) obtain a collecting permit to allow faculty and staff to collect live and fresh samples of invertebrates, marine algae, plants, and fungi from the field to bring into lab, and (4) update, maintain, and make more accessible the existing museum. These elements will provide a diversity of better-quality samples for labs, and indoor and outdoor facilities for student-designed experiments allowing students to better achieve the associated SLO's and PLO's.

The major's series in biology, BIOL 4A and 4B, have added more inquiry-based lab exercises and these are proving successful and allow a more accurate assessment of this learning outcome.

#### Data analysis, information competency, inquiry and reasoning.

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>
10-21-0400-00000-55625-10-21-6551-00000-55625	\$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	<p>Anatomy models, prepared tissue slides, blood-typing cards for pre-nursing courses and biology skills lab for student study</p>

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

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## 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) - Compound microscopes (15) and Dissecting 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

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### 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 Biology department is the main, and possibly only, department that satisfies the Life Science requirement for all students at EVC. It also provides the foundational courses for one of the largest programs at the college, nursing and health sciences. As such, every student at EVC comes through our doors and into our labs. The quality of our courses including the materials and equipment is, therefore, one of the major factors that students experience and plays a significant role in how they

perceive their education at EVC. If we have working and up to date equipment that allows us to teach a high-quality college level course, then students will be better prepared and have a more favorable view of their experience at EVC. If we do not, they will not.

Additionally, the human species now faces the greatest threat to its existence in modern times, global climate change, and we have unlocked the ability to change the genetic code of any organism. These are critical times that require a strong foundation in biology and environmental science. Any student that leaves EVC without a full understanding of these issues and their implications is at a disadvantage and we have failed to properly prepare them for the future.

The Biology department is also the only department that offers unique courses like the Biology 80 series that take students to beautiful natural locations where they not only learn about the ecology while spending time in the ecology, but also interact with each other and faculty in ways that cannot be replicated in a classroom or lab environment. Camping, hiking, viewing wildlife, cooking meals, solving the inevitable problems that arise in the field, and learning how to embrace being outside your comfort zone together as a group in a safe and supportive environment is empowering, and achieves some of the PLO's and ILO's in ways other courses cannot. These courses should be fully embraced by the college, including full funding to eliminate barriers to low-income students and increase the opportunities we can provide.

## Future Needs and Resource Allocation Request

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### 1. Faculty Request

#### Ongoing Budget Needs

(NOTE: can only write numbers - no text allowed)

#### One-Time Expenditure

(NOTE: can only write numbers - no text allowed)

#### Total Expenses (Staffing and Faculty Requests include Salary and Benefits)

#### Request linked to SLO/PLO #

#### Strategic Initiatives (student centered, organizational transformation, community engagement)

No

#### Improving student success rates

No

#### Achievement of program set standard for student success

No

### Total Cost

#### Faculty Request

Ongoing Budget Needs: (NOTE: can only write numbers - no text allowed)

One-Time Expenditure: (NOTE: can only write numbers - no text allowed)

## Attach Files

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Attached File

Biology Budget Request 2023\_2024.pdf (/Form/Module/\_DownloadFile/3639/43692?fileId=458)

## IEC Reviewers

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### **IEC Mentor**

Robert Brown

### **IEC Second Reader**

Fahmida Fakhruddin