CUYAMACA COLLEGE

Annual Update Report

Academic - Biology (BIO) - (MS&E)

Increase enrollment of marginalized populations in the Biology and Pre-Allied Health Major

Program Goal: Increase enrollment of marginalized populations in the Biology and Pre-Allied Health Major
Goal Status: Active

Mapping
2022 - 2028 Strategic Plan: *(X)*

- **Increase Equitable Access:** Increase enrollment of marginalized populations in the Biology and Pre-Allied Health Major (**X**)
- **Increase Hiring and Retention of Diverse Employees:** Increase enrollment of marginalized populations in the Biology and Pre-Allied Health Major (**X**)

Summary of Progress or Results

Summary Date: 09/19/2024
Summary of Progress or Results: The department has made significant progress in increasing enrollment from marginalized populations, especially Hispanic students, but continued efforts are needed to ensure that African-American students and other historically excluded groups are better represented. Further investment in outreach, tailored support services, and interventions to improve retention and success rates for these populations will be essential to achieving the full goal of increasing their enrollment in the Biology and Pre-Allied Health Majors.
Reporting Period: 2024 - 2025
Status: In Progress - will carry forward into next year
Action steps for this academic year.:
Program Action Plan and Progress Updates

1. **Hire Equity-Minded Full-Time Bio 130 and Bio 131 Faculty**
    - **Action Step**: Develop general biology lecture and lab course that is culturally relevant and designed to embrace students, rather than being seen as barriers to success.
    - **Status**: We are hiring a new full-time faculty member to start in Fall 2025 (YAY!!)! We will work with this new faculty member to develop and coordinate equity-minded pedagogy and assist in combining Bio 130 and Bio 131 into Bio 120. This is a critical action step moving forward with this goal.
2. **Continue SACNAS Chapter**
    - **Action Step**: Support the Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) chapter, which fosters the success of underrepresented students in STEM and prepares them to become future STEM leaders. SACNAS also helps students connect with other chapters at four-year institutions for continued support.
    - **Status**: This will remain a continuing action item. Efforts will focus on better advertising the chapter to increase student participation and raise awareness of available resources for underrepresented students in STEM.

Summary of Progress or Results

3. **Advertisement Campaign to Include Representation of Scientists from Different Backgrounds**
    - **Action Step**: Launch an advertising campaign showcasing diverse scientists from various backgrounds.
    - **Status**: Progress has been made toward this campaign, but it has not yet been fully implemented due to time constraints. This item is still in development.
4. **Continue Support and Participation in Kumeyaay Village**
    - **Action Step**: Promote and advertise Kumeyaay Science courses (Bio 133, Bio 134, and Bio 135) and emphasize the importance of diversity in science. Support the Kumeyaay Science Club (E'Muht Mohay) and Village events to ensure they continue to foster inclusivity in science education.
    - **Status**: This will be a continuing action item. The department will continue to support and advertise these courses and the Kumeyaay Science Club and Village events within the department to promote cultural inclusivity and diversity in science.
5. **Replace Failing Incubators to Support Students in Bio 152 and Bio 230**
    - **Action Step**: Replace the failing incubators essential for running Bio 152 and Bio 230. Without these incubators, these courses would be unable to run, thereby eliminating access to these important lab-based courses.
    - **Status**: This is a critical action step, and a request for funding to replace the incubators has been submitted under the supply request.
6. **Increase Student Access to Visual Aids and Organ Models for Bio 140 (Anatomy)**
    - **Action Step**: Provide additional visual aids and organ models for Bio 140 to enhance student learning and engagement in Anatomy.
    - **Status**: This item is part of the supply request for increased resources to support student success in Bio 140.
7. **Incorporate Plant and Animal Cell Models for Bio 130/131 (General Biology) and Major-Level Courses (Bio 230/240)**
    - **Action Step**: Enhance student engagement by incorporating plant and animal cell models in Bio 130/131 (general biology) and upper-division courses (Bio 230/240).
    - **Status**: This request is part of the ongoing supply request to improve the hands-on learning experience for students in these courses.

This action plan reflects ongoing efforts to create an inclusive, supportive environment for all students, with a focus on equity, accessibility, and resources to support student success across various biology courses.

Decrease equity gaps seen in retention and success rates of students of color in 100-level biology courses.

Program Goal: Decrease equity gaps seen in retention and success rates of students of color in 100-level biology courses.
Goal Status: Active

Mapping
2022 - 2028 Strategic Plan: *(X)*

- **Eliminate Equity Gaps in Course Success:** Decrease equity gaps seen in retention and success rates of students of color in 100-level biology courses. (**X**)
- **Increase Completion and Eliminate Equity Gaps:** Decrease equity gaps seen in retention and success rates of students of color in 100-level biology courses. (**X**)
- **Increase Persistence and Eliminate Equity Gaps:** Decrease equity gaps seen in retention and success rates of students of color in 100-level biology courses. (**X**)

Summary of Progress or Results

Summary Date: 09/19/2024
Summary of Progress or Results: While progress has been made in addressing equity gaps, especially through courses like Bio 122, Bio 133, Bio 134, and Bio 135, more work remains in improving retention and success rates for African-American students and other historically excluded groups. A focused approach that includes targeted interventions, culturally relevant teaching, and dedicated support structures will be key to reducing these equity gaps in the department's 100-level biology courses.
Reporting Period: 2024 - 2025
Status: In Progress - will carry forward into next year
Action steps for this academic year.:
The Biology Department has been working diligently on several action items to decrease equity gaps in retention and success rates, especially among students of color, in 100-level biology courses. Below is a summary of the progress and ongoing work in these areas:
Action Steps

1. **Faculty Hire Dedicated to Bio 130 and Bio 131 Equity-Minded Instruction**
    - **Status**: The department will be hiring a new fulll-time faculty member for Fall 2025! We are so excited for the leadership that this position will bring to our highest enrolled course.
2. **Advertising Alternative Courses to Bio 130 for Non-Majors, Specifically Kumeyaay Science Courses**
    - **Status**: This action is in progress. The department is working on communicating with counseling services to better advertise these alternative courses, including Kumeyaay Science courses, which offer culturally relevant content that supports underrepresented groups in STEM.
3. **Develop Community of Practice to Work on Culturally Relevant Curriculum and Equity-Minded Pedagogy**

Summary of Progress or Results

- **Status**: The CRAB (Community of Practice) initiative has been successfully running since Spring 2023 and will continue as an action item. The CRAB community focuses on the development of culturally relevant curriculum and equity-minded teaching strategies to improve student success and retention while providing support to faculty as we work on improving our pedagogical strategies.

4. **Development of Nature Preserve Using Restoration Ecology and Traditional Ecological Knowledge**

   - **Status**: The Kumeyaay Village has been successful as partnership with the Kumeyaay Studies Program and Biology. The project aims to bridge traditional ecological knowledge with restoration ecology, offering students hands-on learning opportunities. Additional materials for the village, such as a shed, have been funded and will increase the ability to use the village as an outdoor learning laboratory.

5. **Professional Development on Disaggregated Data and Equity in Course Success**

   - **Status**: Professional development efforts are ongoing, with a focus on encouraging faculty to engage in the EMTLI program and examine disaggregated data for individual courses. This action will continue to be emphasized to ensure faculty are equipped to address equity gaps in their teaching. Data is evaluated and discussed in department meetings and CRAB.

6. **Monthly Department Meetings for Community Building and Faculty Support**

   - **Status**: Department meetings were held this Fall to make program review more of a community effort. Attendance and participation has been low for such a large department, but we will keep trying as the culture within our department shifts to be more inclusive and collaborative. This will be a continued action item.

   - Our department community of practice has demonstrated this inclusivity by including a chemistry faculty as a co-leader. Our work in CRAB continues to foster a safe environment for faculty to explore and enhance their pedagogy.

7. **Incorporate Plant and Animal Cell Models in Bio 130/131 to Enhance Student Learning**

   - **Status**: This action will be supported by a supply request for models to foster innovation and engagement in Bio 130/131 courses. Research shows that the use of models enhances critical thinking and improves learning outcomes by providing hands-on experiences for students. *Repeated from last year's request as we are not sure if this was funded.*

8. **Increase Student Access to Visual Aids and Organ Models in Bio 140 (Anatomy)**

   - **Status**: A supply request is being made to increase student access to anatomical models and visual aids, which will make the subject matter more engaging and accessible. These tools have been shown to improve learning environments, critical thinking, and overall student comprehension, especially in complex courses like anatomy. *Repeated from last year's request as we are not sure if this was funded.*

9. **Development of Elder's Garden Near the Kumeyaay Village**

Summary of Progress or Results

- **Status**: This project is currently in the planning stage, and no immediate supplies are being requested. The garden will further integrate traditional ecological knowledge and provide additional hands-on learning opportunities for students.

10. **Conduct Student Surveys and Data Requests to Better Understand Student Needs**

    - **Status**: This action aims to gather more comprehensive data on student needs and experiences to inform future teaching strategies and address barriers to success for underrepresented students.

11. **ELAs in Bio 140 and Training for Instructors to Utilize ELAs Effectively**

    - **Status**: The department is working on incorporating ELAs into Bio 140 to ensure instructors are better equipped to support diverse student populations and address equity gaps in course success. This action item is still in progress to determine funding.

Additional Action Items we discussing for the upcoming year:

- **Targeted Retention Programs for Underrepresented Students**: Implement additional mentorship, tutoring, or peer support programs specifically for underrepresented students in the Bio 130/131 and other 100-level courses to increase retention.
- **Culturally Relevant Assessment Strategies**: Develop culturally relevant assessment methods that account for diverse student backgrounds and learning styles, ensuring that all students are equally supported in demonstrating their knowledge and skills.
- **Improved Communication with Counseling and Support Services**: Establish stronger communication with counseling services to ensure that students from historically excluded backgrounds are aware of academic and financial support resources available to them.
- **Community Partnerships for STEM Outreach**: Expand partnerships with local organizations and high schools to engage students in STEM pathways earlier, providing exposure to biology and related fields through outreach activities like field trips, workshops, and guest speakers.

This plan reflects the Biology Department's ongoing commitment to reducing equity gaps in retention and success rates for students of color by implementing inclusive teaching practices, providing additional support, and fostering culturally relevant learning environments. Continued efforts will be made to address the challenges faced by underrepresented students in STEM and ensure their success in both introductory and advanced biology courses.

Program Overview and Update

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Please summarize the changes, additions, and achievements that have occurred in your program since the last program review.

Summary of Changes, Additions, and Achievements Since the Last Program Review

Since our last program review, our program has accomplished significant milestones that reflect our commitment to student success, equity, and academic excellence.

Community Engagement and Collaboration

We actively participated in the San Diego Festival of Science and Engineering in Spring 2024, collaborating with the Engineering and Kumeyaay Studies programs. This event aimed to inspire K-12 students in STEAM and allowed our students to teach Kumeyaay science and cosmology, showcasing the integration of modern biology with traditional knowledge. The enthusiastic participation at our booth highlighted our dedication to fostering a love for STEAM within diverse communities.

Our Kumeyaay science students have had the unique opportunity to gain real-life research experience and build meaningful connections with UCSD faculty, members of Climate Science Alliance and Kumeyaay elders through the TIDES (Tribal Intertidal Digital Ecological Surveys)project and the Kendall-Frost Marsh Reserve. In the Spring, students gathered data for the TIDES project. This project integrates traditional ecological knowledge with advanced imaging techniques to enhance conservation efforts in the face of climate change. This fall, students participated in the Kupiihaaw Mataayum (*Autumn Gathering*) at Kendall-Frost Marsh, a reserve managed by UCSD. This event allowed students to engage in cultural activities such as basket weaving, pottery making, bird watching, and native plant restoration. Through these experiences, students explored the deep connections between modern scientific practices and traditional knowledge systems, enriching their understanding of how these approaches complement one another in addressing ecological challenges. *Please refer to the attached PDF for images.*

Curriculum Innovations and Faculty Development

In alignment with Grossmont College, we have undertaken a major curriculum redesign, merging the general biology lecture and lab courses (Bio 130 and Bio 131) into a single course (Bio 120). This change aims to reduce confusion for pre-Allied Health students regarding prerequisites, improve student success, and foster stronger student-instructor relationships. The updated curriculum is set to launch in Fall 2025.

Through our Community of Practice (CRAB), we have focused on supporting faculty and advancing curriculum initiatives. Key efforts include piloting the online platform “Codon Learning” to enhance metacognitive strategies in general and major-level biology courses. We have also worked on addressing equity gaps in general biology and anatomy courses through data-driven approaches. By reviewing success and retention data, we have identified areas for improvement and brainstormed actionable solutions.

We have also explored the effective use of AI tools, leveraging an AI bot provided in EMTLI to enhance teaching practices. CRAB members participated in an interactive workshop focused on reflecting on our core teaching values and aligning teaching philosophies with equity-minded goals. Using the AI tool, we developed our department’s philosophy and mantra, rooted in our shared beliefs and values. These efforts highlight our commitment to fostering an equitable, collaborative, and innovative learning environment for our students and faculty.

The department philosophy and mantra reflects our collective vision and values, but we will continue to develop it during our first department meeting in Spring 2025 to ensure all faculty have input.

This is our Biology Department philosophy we developed in CRAB this Fall:

In our Biology Department, we embrace a learner-centered philosophy that prioritizes the holistic development of our students, fostering an environment of trust, care, and empowerment. We are committed to meeting each student

Annual Update

where they are, nurturing their curiosity and resilience through culturally responsive teaching and diverse assessment methods. By integrating interdisciplinary collaboration and real-world applications, we strive to cultivate critical thinkers who are prepared for future academic and career paths. Our approach emphasizes personalized learning and continuous growth, encouraging students to take ownership of their educational journey and to embrace challenges as opportunities for development. Through this supportive and inclusive framework, we aim to inspire a lifelong passion for learning and a deep connection to the world and nature.

Our department mantra became an acronym, as we love acronyms. We are planning to make posters to advertise our commitment to student learning and success to our students and as a reminder to ourselves. This is our mantra turned acronym:

C.L.I.M.B.

- **C**uriosity Driven: Foster curiosity and exploration in diverse knowledge systems.
- **L**ifelong Learning: Cultivate a commitment to continuous learning and personal growth.
- **I**nformed Community: Build a more informed, aware, and connected community.
- **M**entorship & Empowerment: Empower students through mentorship and self-discovery.
- **B**ridge to Success: Prepare students for future academic and career pathways with confidence and resilience.

Expanding Collaboration Across Disciplines

CRAB expanded this semester to include chemistry faculty, forming a combined initiative called CRAB and SQRL (Seeking Quality and Realistic Lessons). This collaborative effort allows fresh perspectives on success, retention, and equity data, enhancing our ability to address challenges holistically as we serve many of the same students. It also culminated in a cuter logo with the assistance of AI tools that includes both a crab and squirrel doing science. *Please refer to the attached PDF for logo.*

Equity and Accessibility Initiatives

We have worked to bridge equity gaps by purchasing anatomy models for increased representation and supporting the development of a Kumeyaay Village in the campus nature preserve.

To meet rising demand and improve accessibility, we added new sections of Bio 230 on alternative days and opened a fully in-person section of Bio 141 as the other two sections were only offered in a hybrid modality.

Program Growth and Enrollment Success

Our program has experienced a dramatic rise in enrollment and increasing waitlists in several biology courses, such as Bio 140, 141, 141L, 230, and 152. To accommodate this growth, we added sections for these high-demand courses and are planning to add a section of Bio 152 in Fall 2025.

This growth highlights the need for budget augmentation, especially as inflation has caused a significant rise in the cost of course materials. Without additional funding, sustaining this growth and maintaining program quality will not be possible.

Campus Leadership and Contributions

Faculty members have taken on vital leadership roles across the campus, including serving as ROC co-chair, Program Review co-chair, and Accreditation co-chair. These roles demonstrate our faculty's commitment to institutional development and shared governance.

Our program's efforts to improve access, success, and equity have positioned us as a leader in the campus community. However, the rapid growth in enrollment and rising costs underscore the urgent need for additional resources to sustain and expand our achievements.

Attach Related Documents - Program Overview and Update

Program Review Update Images.pdf

Assessment and Student Achievement

After looking at the SLO information for the past year in Nuventive Improve, are you are on track for the 4-year assessment cycle?

Yes

Annual Update

If you answered no above, please describe the department's plan to ensure SLOs are assessed every 4 years.
NA

Which courses have not been assessed in the last 4 years?
The Biology classes are on track for SLO assessments to be completed by Spring 2025 in order to use this data to assess PLOs in Fall 2025.
Knowing whether or not the assessments are submitted has been a challenge to easliy track. A number of courses have been scheduled to be assessed and the assessments have been discussed in the SLO meetings during professional development, but the data has not been either uploaded or posted yet.
Courses that are scheduled for assessment this Fall are Bio 141L. Courses scheduled for assessments in Spring 2025 are Bio 131, Bio 135 and Bio 230.

If you did not assess in the last year, please share why, including whether your program is experiencing barriers to assessment or data submission, and/or if your program would benefit from outcomes and assessment support.
NA

Please share any outcomes assessment projects your program has worked on in the last year, including SLOs on Canvas, PLOs by ACP, Equitable Assessment Strategies (innovative collective/common assessments, project-based, work-based learning, student-centered, etc.), or other.

SLO Data and Assessment Plans

In our pre-Allied Health program, recent outcomes assessments for anatomy and physiology courses have led to refined assessment strategies to better support student learning. For anatomy (Bio 140), we are piloting a new approach to assessing SLOs in Fall 2024 to help students apply course content more effectively to clinical scenarios. In physiology (Bio 141 and 141L), updated SLOs and reorganized lab activities are being implemented to align more closely with course content, with a focus on more accurate and streamlined assessments starting in Fall 2024.

1. Outcomes Assessment for Bio 130 (general biology lecture)
    - SLO for this course have been streamlined into a single broad outcome that focuses on assessing concept learning rather than multiple specific content-based outcomes. Because of this, we have been able to implement more interactive and engaging group collaborative work to evaluate student understanding. This approach allows us to choose which content to assess within the broader framework of concept mastery. As part of this effort, we utilized a hands-on project to evaluate students' ability to apply the concept of "form following function." In this project, students worked together to design and construct an alien cell, applying their understanding of cellular structures and their corresponding functions.
        - Remarkably, all students who were present and participated in the project successfully passed the SLO for the course, highlighting the effectiveness of this engaging and collaborative assessment method.This assessment was collaboratively developed in our community of practice, CRAB. See attached PDF for example of assessment titled "Cellular Organelles | How Cells Work -CRAB Fine tune (SLO assessment example)".
2. Outcomes Assessment for Bio 140 (anatomy lecture and lab)
    - Our recent assessments revealed that while students excel in applying information directly related to course content, they struggle with critically applying this knowledge to clinically relevant case studies that are not explicitly covered in the course.
    - To address this, we plan to modify our assessment strategy. A comprehensive case study proved overwhelming for students, so in Fall 2024, we will pilot assessing two SLOs in a more manageable format. Specifically, we will assess SLO 4 during Unit 1 and SLO 2 during Unit 5.

Annual Update

3. Outcomes Assessment for Bio 141 (physiology lecture)
    - The updated SLOs, developed collaboratively by faculty, now better align with course content.
    - Assessment throughout the semester has demonstrated that the final course grade reflects student success more accurately than individual assessments targeted at specific SLOs.
    - In Spring 2025, we plan to assess individual SLOs through take-home assignments following each major topic, in addition to using the final grade as a broader indicator of student performance. We're also working on integrating Canvas tools for more streamlined assessments.
4. Outcomes Assessment for Bio 141L (physiology lab)
    - To optomize student learning and to better match course content, we have narrowed down and reorganized lab activities.
    - Three new SLOs will be assessed starting in Fall 2024, using identified lab activities, reports, and presentations as assessment tools.

In our Biology program, recent assessments for major-level biology courses have focused on fostering mastery in key concepts through interactive and engaging learning strategies. Our assessments highlight the Biology program's commitment to interactive learning methods that deepen student engagement and understanding, ensuring the successful achievement of course outcomes.

1. Outcomes Assessment for Bio 240 (organismal, evolutionary and ecology)
    - For our major-level course SLOs were assessed as a progression toward achieving mastery in key concepts. Assessments incorporated project-based learning, such as the "Hopeful Monster" project, which explored the principle of structure following function through the content of animal organ systems. In-class collaborative activities that synthesized key concepts in evolution and classification were also utilized. These activities were designed to actively engage students and foster a deep understanding of the material, enabling them to apply the major concepts of the course to broader content. All students who actively participated in these activities successfully passed the SLO, demonstrating the effectiveness of this approach. Please refer to PDF of the presentation instructions for the project titled "Hopeful Monster Instructions Bio 240 Assessment".
2. Outcomes Assessment for Bio 230 (cell and molecular biology) We have expanded the offering of this course by adding a second section, which will be assessed in Spring 2025.

PLO Updates and Assessment Plans

PLOs were revised and updated Fall 2024. These PLO will be mapped by SLO and mapped to ILO in Spring 2025 and assessed in Fall 2025.

Equitable Assessment Strategies

In our recent outcomes assessment projects and community of practice meeting discussions, we have focused on implementing equitable assessment strategies to address retention and success gaps, particularly among underrepresented groups. One of our key initiative proposals is to develop workshops on planning, time management, and study skills, which we believe will empower students with the metacognitive skills needed for students to take control of their learning. Our current strategies focus on developing and implementing pedagogical approaches that foster a more inclusive learning environment and promote long-term student success. By drawing on faculty expertise and fostering collaboration, we are committed to doing the challenging but essential work of supporting one another to create effective and equitable learning opportunities for our students.

Annual Update

Attach Related Documents - Assessment and Student Achievement
Cellular Organelles _ How Cells Work -CRAB Fine tune (SLO assessment example).pdf;
Hopeful Monster Instructions Bio 240 Assessment.pdf

Student Achievement

Please discuss any equity gaps in access or success.
Retention rates have fluctuated, ranging from 78% to 91% across terms, with a peak of 91% in Spring 2021. Success rates, however, have been more variable, fluctuating between 67% and 77%, and tend to be lower in the fall semesters compared to spring. Significant equity gaps in success and retention persist among demographic groups. Black/African American students have shown retention rates between 68% and 94%, with a high in Spring 2021, but their success rates consistently lag, dropping as low as 51% in Fall 2020 and reaching 75% in Fall 2022. Hispanic/Latino students have demonstrated steady retention improvements since Spring 2020, ranging from 71% to 91%. However, their success rates, while improving, remain lower than retention, increasing from 56% in Fall 2020 to 72% in Spring 2024. White students consistently exhibit the highest retention (85%-93%) and success rates (73%-84%), highlighting disparities that warrant continued focus on addressing barriers to equitable success. Please see below for a breakdown of the statistics and click the link for graphsof the 5-year trends. Please refer to the PDF "Program Review Department Data Graphs 24/25" to examine the graphs.
Overall Trends:

- Retention rates have fluctuated between 78% and 91% across terms, with a peak in Spring 2021 (91%).
- Success rates fluctuate more, ranging from a low of 67% to a high of 77%. These rates tend to be lower in the fall semesters than in spring.

Equity Gaps by Demographic Group:

- **Black/African American Students**: Retention rates ranged from 68% to 94%, with the highest in Spring 2021. However, their success rates consistently lag, reaching as low as 51% in Fall 2020 and as high as 75% in Fall 2022.
    - Important to note is the success and retention peaked and was the highest for any student groups in Fall 2022. This corresponds with the department completely returning to campus from Covid restrictions and HERF funds and other institutional supports (ie. laptops/hotspots available) still in place.
    - As soon as the extended institutional support from Covid ended, so did the success and retention rates fall for this population.
- **Hispanic/Latino Students**: Retention has been fairly consistent, ranging from 71% to 91%, with notable improvement since Spring 2020. Success rates are generally lower than retention rates but have risen slightly, from a low of 56% in Fall 2020 to 72% in Spring 2024.
- **White Students**: This group consistently has the highest retention and success rates. Their retention rates range from 85% to 93%, and success rates range from 73% to 84%.

What action will the department or discipline take to address these equity gaps?
The Biology Department continues to actively address equity gaps by fostering inclusivity and focusing on data-driven improvements. Despite ongoing initiatives, gaps persist, which reinforces the department's commitment to refining strategies.
The Biology Department is committed to addressing equity gaps by enhancing curriculum alignment and improving student support. To foster inclusivity and strengthen learning outcomes, we are working on a significant curriculum update: combining the general biology lecture (Bio 130) and lab (Bio 131) into a single course, Bio 120. This change aligns with Grossmont and other community colleges and is designed to reduce equity gaps by facilitating more integrated and interactive learning experiences.

Annual Update

By combining the lecture and lab, we aim to create more opportunities for direct interaction between students and instructors. This structure will ensure that hands-on lab activities directly support lecture content, reinforcing key concepts through active learning and helping students better engage with the material. We believe this approach will support all students and particularly help close equity gaps by providing a more cohesive and accessible learning environment.

Bio 140 continues to present challenges, with success rates lower than desired, prompting us to investigate factors like student preparedness and prerequisites. Specifically, we are exploring the correlation between students' prerequisite coursework location (either at our institution or elsewhere) and their performance in Bio 140. This data will help us target areas for improvement in retention and success.

To support students in Bio 140, we have implemented additional resources, including extended open lab hours, six tutors, and faculty-led anatomy games in the STEM center to boost engagement. Nevertheless, given that Bio 140 outcomes haven't improved as expected, we are planning a study to examine potential root causes, such as the adequacy of Bio 130/131 as a preparatory course or the impact of prerequisites taken outside Cuyamaca.

To further support student success, we are considering introducing a support course or embedding learning assistants in Bio 140. This proposal will be informed by a planned study on similar support courses and their success rates, and we are seeking to train embedded learning assistants to enhance the learning experience across anatomy sections.

The Biology Department is dedicated to addressing equity gaps by not only enhancing our curriculum but also fostering an inclusive and supportive community within our department. We actively encourage our faculty to participate in professional development programs such as the Equity-Minded Teaching and Learning Institute (EMTLI) and initiatives aimed at humanizing STEM courses. Our CRAB (Culturally Relevant Activities in Biology) community of practice is another vital component, promoting culturally relevant teaching strategies and building a shared commitment to equity. Through these programs, we aim to cultivate a collaborative culture among faculty and staff, emphasizing inclusivity and a growth mindset. This positive and supportive environment not only benefits faculty development but also directly enhances the classroom experience, creating a learning space where all students feel valued and are empowered to succeed.

Please describe any enrollment changes (increases/decreases) over the past year and the context for these changes.

The increase in enrollment over the past year is a direct result of several strategic initiatives designed to enhance accessibility and engagement. STEM ACP and high school outreach events played a crucial role in attracting students to our programs, particularly those interested in health-related careers. Additionally, curriculum adjustments and modality changes, such as offering physiology lectures in a hybrid format, allowed for greater flexibility and reached a wider audience. The department also expanded section offerings at varied times to accommodate students' schedules, ensuring increased access. Collaboration with other MSE departments, facilitated by AirTable to create coordinated block schedules, further enhanced the availability of courses. These efforts collectively contributed to the significant enrollment growth observed, though continued focus on equity in success rates remains essential.

Over the past five years, the biology department has demonstrated resilience and adaptability, navigating significant fluctuations in enrollment due to the COVID-19 pandemic. The department offers a diverse range of courses, including major-level transfer courses for the Biology Program (Bio 230 and 240) and Pre-Allied Health Program (Bio 140, 141, and 152), prerequisite and general education biology courses (Bio 130/131 122), and classes that support the Kumeyaay Studies program as part of the Kumeyaay science general education curriculum (Bio 133, 134 and 135). While the pandemic necessitated a skeleton schedule, reducing the number of available classes, the department has since rebounded with strong enrollment growth and renewed student interest.

Please review the graphs on the attached PDF: Program Review 24/25 Enrollement Trends -Graphs.

Summary of Enrollment Changes

Over the past year, the department has seen a significant increase in overall enrollment. Total enrollment across all courses grew from 707 (Spring 2023) to 811 (Spring 2024). This growth aligns with increased demand for health-related and advanced biological sciences education. It also is seen as we have been able to add more course sections to our schedule.

Annual Update

- **Biology Program (Bio 230 and 240):** Enrollment rose from 71 (Spring 2023) to 107 (Spring 2024), surpassing pre-pandemic levels.
- **Pre-Allied Health Program (Bio 140, 141, and 152):** Enrollment reached its highest level in recent years, increasing from 254 (Spring 2023) to 321 (Spring 2024).

Additionally, the department's general education courses and Kumeyaay science offerings continue to attract diverse student populations. These courses play a vital role in fulfilling general education requirements and advancing the integration of Indigenous knowledge into science education.
Disaggregated enrollment data shows that Hispanic students are driving much of the recovery and growth, particularly in the Pre-Allied Health Program, where their enrollment increased from 84 (Fall 2022) to 142 (Spring 2024). African-American student enrollment, while gradually improving, remains low and highlights the need for ongoing equity-focused initiatives.

Overall Enrollment Trends (2019-2024)

- **Impact of COVID-19:**
  - Enrollment dropped significantly during the pandemic due to reduced course offerings. The department operated on a skeleton schedule, which contributed to the decline from 988 (Spring 2020) to 576 (Fall 2022).
- **Recovery and Growth:**
  - Enrollment has bounced back with incredible growth, increasing from 576 (Fall 2022) to 811 (Spring 2024). This recovery highlights strong demand for biology programs as students return to in-person and hybrid learning.
- **Pre-Allied Health Program (Bio 140, 141, 152):**
  - Experienced a similar rebound, from a low of 219 (Fall 2022) to 321 (Spring 2024).
  - Reflects sustained interest in health-related career pathways.
- **Biology Program (Bio 230, 240):**
  - Despite pandemic-related dips, enrollment grew from 66 (Fall 2022) to 107 (Spring 2024), demonstrating renewed student interest in advanced biological sciences and increased access due to adding a section of Bio 230 at a different day and time than previously offered in the district.

Disaggregated Enrollment Data

- **Historically Excluded Populations:**
  - **African-American Enrollment:** While showing stability, this population remains underrepresented, with 42 students in Spring 2024 compared to 43 in Fall 2019.
  - **Hispanic Enrollment:** Significant recovery from pandemic lows (222 in Fall 2022 to 326 in Spring 2024), underscoring outreach success.
  - **White Enrollment:** Saw a steady decline from 318 (Fall 2019) to 176 (Spring 2024), reflecting a potential shift in student demographics.
- **Pre-Allied Health Disaggregation:**
  - African-American student enrollment in this pathway increased from 9 (Fall 2022) to 17 (Spring 2024).
  - Hispanic enrollment showed robust growth, from 84 (Fall 2022) to 142 (Spring 2024).

Areas of Growth

Annual Update

1. **Post-Pandemic Enrollment Surge:**
    - Rapid recovery in overall enrollment showcases the department's ability to attract and serve a diverse student population. This has been aided by student centered scheduling and addition of new course sections.
2. **Hispanic Student Representation:**
    - Sustained and significant growth, particularly in pre-Allied Health courses.
3. **Biology Major Course Enrollment:**
    - Enrollment in Bio 230/240 has rebounded, reflecting renewed interest in major-level biology.

Areas for Improvement

1. **African-American Representation:**
    - Despite slight increases, this population remains consistently underrepresented. Targeted recruitment, retention, and support are needed.
2. **Equity in Success Rates:**
    - While enrollment trends are positive, ensuring proportional success for historically excluded populations must remain a focus.

Budget Augmentation Request
Critical Need for Financial Support:

- **Increased Costs and Enrollment:**
    - Incredible growth in enrollment translates to higher demand for lab materials, supplies, and equipment. These resources are essential for maintaining quality instruction, particularly in expensive lab-based courses.
    - Current budgets are insufficient to sustain the growth observed since Fall 2022.
- **Recommendation:**
    - Request a proportional increase in lab supply funding to accommodate increased student numbers and ensure equitable access to high-quality education.
    - Highlight the role of inflation in driving up lab costs, compounding the financial burden of higher enrollment.
    - Please see Budget Augmentation Request for more information

By recognizing the pandemic's impact and leveraging current growth, the department can justify the need for enhanced funding to support continued success.
The department as a whole has demonstrated remarkable growth over the past year, rebounding strongly from the challenges of the pandemic. The increase in enrollment across programs underscores the importance of these courses in meeting student and community needs, particularly as they relate to health-related career pathways and culturally relevant education through the Kumeyaay Studies program. However, sustaining this growth will require additional budget support to address increased lab supply costs and ensure equitable access to resources. By securing this support, the department can continue to thrive while fostering student success and maintaining its commitment to innovative and inclusive education.

Annual Update

If your program has seen a significant decline in enrollment over the past year, what resources or support would be helpful to improve program enrollment and access?
NA

What has this data revealed about the progress of the program review goals you set?

Progress of Program Goal 1: "Increase Enrollment of Marginalized Populations in the Biology Major"

The department has made notable strides toward increasing the enrollment of marginalized populations, particularly through strategic outreach and curriculum adjustments. Several initiatives have contributed to this progress:

1. **Outreach Efforts**: STEM ACP events and high school outreach have directly impacted the recruitment of historically excluded groups, particularly Hispanic students, as evidenced by their significant enrollment growth (from 222 in Fall 2022 to 326 in Spring 2024). These efforts have helped bridge the gap and attract a more diverse student population to the Biology Major.

2. **Additional Section Offering:** The department has made significant strides in increasing accessibility and flexibility for students, particularly those from marginalized backgrounds, through strategic scheduling. By adding an additional section of Bio 230 at a different day and time than what is offered in the district, the department has provided greater access to the Biology Major for students facing scheduling challenges, including those with work or family commitments. This change has been particularly impactful for Hispanic students, contributing to an increase in enrollment in this course. However, it is important to note that Bio 230 includes an expensive lab component, which presents a financial challenge as the department seeks to maintain the added section. To continue offering this additional section, which has shown to benefit enrollment, particularly among Hispanic students, a budget augmentation is needed to cover the increased costs of lab supplies and materials. Securing this funding will allow the department to sustain and expand these offerings while continuing to support student access and success.

3. **Collaboration Across MSE Departments**: The use of AirTable to coordinate block schedules across departments has created more seamless scheduling, further supporting increased enrollment in the Biology Major. This collaboration helps ensure that courses are available in a timely manner, reducing barriers to entry for marginalized populations.

However, while these efforts have contributed to growth, there are still challenges to address, particularly with regard to African-American student enrollment, which remains underrepresented. The slight increase in African-American enrollment from Fall 2022 (9 students) to Spring 2024 (17 students) is a positive step, but more targeted recruitment, retention, and support strategies are necessary to ensure these students are not only enrolling but also succeeding in the program.
Conclusion: The department has made significant progress in increasing enrollment from marginalized populations, especially Hispanic students, but continued efforts are needed to ensure that African-American students and other historically excluded groups are better represented. Further investment in outreach, tailored support services, and interventions to improve retention and success rates for these populations will be essential to achieving the full goal of increasing their enrollment in the Biology Major.

Progress of Program Goal 2: "Decrease Equity Gaps in Retention and Success Rates of Students of Color in 100-Level Biology Courses"

The department has made significant efforts toward addressing equity gaps in retention and success rates, particularly for students of color in 100-level biology courses. These efforts have been guided by a focus on inclusive teaching practices, course design adjustments, and targeted student support services.

1. **Retention and Success Trends**: The department has recognized the persistence of equity gaps, particularly for African-American students, in both retention and success rates. Despite the increase in enrollment, including efforts to boost participation from marginalized populations, challenges remain in closing these gaps, especially for African-American students. These disparities highlight the need for tailored interventions to ensure that students not only enroll but also succeed and complete courses.

Annual Update

2. **Non-Majors and Kumeyaay Science Courses**: Notably, courses such as Bio 122 (non-majors general biology course, The Secret Life of Plants), Bio 133, Bio 134 and Bio 135 (non-majors Kumeyaay Science general biology courses) show no significant equity gaps in terms of retention or success rates. These courses have demonstrated successful engagement with students of color, possibly due to their relevance to students' cultural backgrounds and career pathways in environmental science. The Kumeyaay Science courses, in particular, provide a culturally relevant approach that resonates strongly with Indigenous students and those from similar backgrounds, leading to more equitable outcomes.

3. **Strengths in Outreach and Teaching Methods**: Initiatives such as STEM ACP events, high school outreach, and increased flexibility in course offerings (e.g., hybrid physiology lectures) have supported enrollment, particularly in health-related pathways. Additionally, the collaboration with MSE departments to coordinate block schedules and increase access has helped in providing students of color with greater opportunities to enroll in these courses. These efforts should continue to be expanded to support retention and success, particularly in the context of students facing additional challenges.

4. **Curriculum Modifications in General Biology:** To address equity gaps and improve student success, the department is modifying the general biology curriculum by combining Bio 130 (lecture) and Bio 131 (lab) into a single course, Bio 120, to align with Grossmont's curriculum. This change is designed to alleviate prerequisite confusion that has been a barrier for students, particularly those pursuing Allied Health pathways. Combining the lecture and lab components will enhance continuity between the two, allowing for better integration of concepts and increasing the time students spend with their instructors. These changes aim to improve both retention and success rates by fostering stronger student-instructor relationships and ensuring a cohesive learning experience.

5. **Challenges in Equity for African-American Students**: While Hispanic student enrollment and success rates have seen positive growth and retention, African-American students remain underrepresented, and success rates for this group continue to be a challenge. The department's efforts to address these gaps must include more targeted recruitment, culturally relevant teaching practices, and additional support services designed to ensure that students from African-American and other underrepresented communities thrive in 100-level courses.

6. **Future Focus and Strategy**: The continued focus on developing culturally responsive curriculum and providing targeted interventions—such as workshops on time management, study skills, and tutoring—will be essential in addressing these gaps. Increasing faculty development opportunities for inclusive teaching practices, and ensuring that support services are easily accessible and effective, will contribute significantly to improving the retention and success rates of students of color.

Conclusion: While progress has been made in addressing equity gaps, especially through courses like Bio 122, Bio 133, Bio 134, and Bio 135, more work remains in improving retention and success rates for African-American students and other historically excluded groups. A focused approach that includes targeted interventions, culturally relevant teaching, and dedicated support structures will be key to reducing these equity gaps in the department's 100-level biology courses. By incorporating these curriculum changes and maintaining a commitment to equity-driven initiatives, the department is well-positioned to make meaningful strides toward achieving its program goal.

Attach Related Documents - Student Achievement
Program Review Department Data Graphs 24_25.pdf;
Program Review 24_25 Enrollement Trends -Graphs.pdf

Distance Education Course Success (If Applicable)

If your department offers distance education classes, how do you ensure Regular and Substantive Interaction (RSI) is being implemented?

Regular and Substantive Interaction (RSI) in Distance Education Classes

Our department offers two fully online courses—Bio 122: The Secret Life of Plants and Bio 133: Ethnoecology—that are designed to ensure regular and substantive interaction (RSI) between students and instructors. Although these courses are delivered online, both include a synchronous Zoom component, allowing for real-time interaction and fostering meaningful engagement among students and the instructor. This synchronous element ensures that students have an opportunity to ask questions, participate in discussions, and receive immediate feedback.

In addition to Zoom sessions, both courses incorporate live-streamed field trips, providing students with the option to attend in person or engage remotely via Zoom. This approach not only enriches the learning experience but also promotes regular interaction with the course content and peers.

To further increase student engagement, the courses utilize online learning platforms such as Padlet, Zoom polls and Slides with Friends. These tools encourage active participation, allowing students to share ideas, respond to prompts, and engage with course material in real-time. By using interactive technologies, the department ensures that students remain actively involved throughout the course, enhancing their learning experience.

These strategies have proven effective in fostering regular and substantive interaction, as evidenced by the high success and retention rates of both courses. Bio 122 has maintained a 91% average retention rate and 76.5% success rate over the past five years, while Bio 133 has seen a retention rate of 88% and a success rate of 76%. These strong outcomes demonstrate the department's commitment to ensuring that all students, regardless of modality, have the opportunity to succeed and remain engaged in their learning.

Program Goals

Program Goals Status

I have updated the progress on my previous goals.

Program Goals Mapping

Mapping for all active Program Goals complete.

Submission

Program Review response is complete and ready for review.

Yes - Response complete and ready for review