CUYAMACA COLLEGE

Comprehensive Program Review and Dean Feedback 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: 01/08/2026

Summary of Progress or Results

Summary of Progress or Results: The 2020–2025 data reaffirm that both goals continue to address real and persistent needs within the program. However, our review of disaggregated data suggests that these goals should be refined to emphasize sustainability, depth, and measurable impact.

Data Insight: Enrollment trends indicate meaningful progress in representation at the 100-level, with Hispanic/Latinx and African American student participation increasing over time (see Figure 1 from the Program Review Data and Figures document). Between Fall 2020 and Spring 2025, White students' proportional representation declined from approximately 45% to 35%, while Hispanic/Latinx student representation increased from 28% to 36%, and African American student representation increased from 6% to 8%. Notably, this increase in African American representation at the 100-level exceeds the college-wide trend, where African American enrollment declined slightly from 6% in Fall 2020 to 5% in Spring 2025, indicating that introductory Biology courses are serving as an effective access point for these students.

However, it is critical to contextualize these gains within distinct academic and career pathways. At this institution, 100-level Biology courses primarily function as pathways to allied health careers, such as nursing, clinical technicians, and other applied health professions. In contrast, 200-level Biology courses serve as pathways for Biology majors pursuing careers in medicine, dentistry, research, and graduate or professional programs. While movement between pathways is possible, 100-level coursework does not inherently lead into the 200-level sequence, and the two tracks represent different educational trajectories with different long-term earning potential.

Despite improved access at the 100-level, this pattern has not translated into proportional representation in 200-level (major-level) coursework (see Figure 2 from the Program Review Data and Figures document)). At the 200-level, Hispanic/Latinx students comprise approximately 30% of enrollment, while African American students remain significantly underrepresented at approximately 1.6%. This disparity suggests that students from historically underserved groups are more likely to be concentrated in applied health pathways than in Biology major pathways that lead to higher-paying, research and professional degree careers. Addressing this gap is central to advancing equity in access, persistence, and long-term economic mobility.

Refined Focus:
To strengthen this goal, the department will shift from a prerequisite-based lens to a pathway and outreach-focused approach that more intentionally supports students, particularly those interested in the Biology major, in navigating entry into 200-level coursework. This includes distinguishing between Biology majors and pre-Allied Health students and ensuring that advising, messaging, and academic support clearly communicate preparation expectations and opportunities for success in Bio 230 and Bio 240.

Reporting Period: 2025 - 2026
Status: In Progress - will carry forward into next year
What resources, if any, are needed to achieve this goal? (Select all that apply): New faculty position, New classified position, Supplies, equipment, and/or furniture
Action steps for this academic year.:

Action Plan and Resource Requests (2025–2026)

Action Item 1: Develop a Biology Pathways Equity Plan

Action Step:

Develop and implement a Biology Pathways Equity Plan that clarifies distinctions between pre-Allied Health (100-level) and Biology major (200-level) pathways; strengthens outreach and advising for prospective Biology majors; and incorporates early faculty engagement and mentoring for students transitioning into Bio 230 and Bio 240.

Summary of Progress or Results

Rationale:

Data show that while access at the 100-level has improved, students from historically underserved groups remain disproportionately underrepresented in 200-level Biology coursework. Clearer pathway messaging and early academic support are necessary to support equity in access to transfer-oriented and high-opportunity biology careers.

Action Item 2 (Continuing): Support and Expand SACNAS

Action Step:

Continue departmental support for the **Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS)** chapter through improved advertising, faculty mentorship, and integration with Biology courses and transfer pathways.

Rationale:

SACNAS provides critical community, mentorship, and transfer connections for students from underrepresented backgrounds pursuing STEM and Biology pathways and remains a core equity strategy.

Action Item 3 (Continuing): Advertising and Representation of Scientists

Action Step:

Advance the departmental advertising campaign highlighting scientists from diverse cultural, racial, and disciplinary backgrounds across Biology and allied health fields.

Rationale:

Representation supports student belonging and helps students envision themselves in Biology major, research, and professional science careers—particularly those associated with 200-level coursework.

Action Item 4 (Continuing): Support and Participation in the Kumeyaay Village and Learners' and Elders' Gardens

Action Step:

Continue promoting and supporting Kumeyaay Science courses (Bio 133, Bio 134, Bio 135), the E'Muht Mohay student club, and Kumeyaay Village activities; expand interdisciplinary collaborations (e.g., Learners' and Elders' Gardens) that connect Biology students to culturally sustaining, applied science experiences.

Rationale:

Place-based and culturally grounded learning environments strengthen student engagement, persistence, and sense of belonging across Biology pathways.

Action Item 5: Hire a Full-Time Physiology Faculty Member (Bio 141 / Bio 141L) – NEW

Action Step:

Hire a full-time Physiology (Bio 141 / Bio 141L) faculty member to replace a recent retirement and sustain the department's ability to offer sufficient sections of Physiology lecture and lab.

Rationale:

Physiology is a high-demand, 100-level gateway course for allied health pathways, including nursing and other healthcare programs. Without a replacement hire, the department will be unable to sustain current enrollment levels or accommodate continued growth, creating bottlenecks that disproportionately impact students pursuing allied health careers. This hire is critical to maintaining access, reducing time-to-completion, and supporting equity in high-demand health science pathways.

Action Item 6: Increase Biology Lab Technician Support -NEW

Action Steps:

Summary of Progress or Results

- Reclassify the current 10-month evening Biology lab technician position to a 12-month position to support expanded summer offerings, evening labs, and year-round preparation needs.
- Convert the shared part-time Chemistry lab technician position to a full-time, 12-month Biology/Chemistry position serving both departments in the Annex.

Rationale:
Enrollment growth, expanded course offerings in both Biology and Chemistry have significantly increased lab preparation, maintenance, and safety demands. Adequate lab technician staffing is essential to maintain enrollment capacity, ensure laboratory safety, and support equitable access to both allied health and Biology major pathways.

Action Item 7: Strategic Scheduling and Cross-College Alignment

Action Step:
Continue collaborating with Counseling, the Dean, and Grossmont College's Biology Department to align prerequisites, transfer expectations, and scheduling of courses, including exploring hybrid and evening formats to expand access.

Rationale:
Strategic scheduling and district-wide alignment reduce structural barriers for working students and support equitable access to 100 and 200-level Biology pathways.

Closing Statement

Together, these actions build on prior equity-focused efforts and move the department from access in *principle* to access in *practice*, ensuring that students particularly those from historically underserved groups are supported across both allied health and Biology major pathways and can advance toward high-opportunity careers.

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 Persistence and Eliminate Equity Gaps:** 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**)

Summary of Progress or Results

Summary Date: 01/08/2026

Summary of Progress or Results: Data Insight

Over the past five years, success rates for Hispanic/Latinx and African American students in 100-level Biology courses increased by 17 and 23 percentage points, respectively; however, an approximately 8-point success gap remains when compared to White students. Retention gaps have largely closed, indicating improved persistence, but disparities persist in final course outcomes particularly in gateway STEM courses such as Anatomy, Physiology, and Microbiology.

Refined Focus

To move from broad equity intentions to targeted, sustainable improvement, the department will focus on course-level interventions informed by disaggregated SLO data, strengthened instructional capacity, and improved laboratory and instructional infrastructure. Emphasis will be placed on maintaining access and success in high-enrollment 100-level courses while addressing structural barriers that disproportionately affect students of color.

Reporting Period: 2025 - 2026

Status: In Progress - will carry forward into next year

What resources, if any, are needed to achieve this goal? (Select all that apply): New faculty position, New classified position, Supplies, equipment, and/or furniture

Action steps for this academic year.:

Action Plan and Resource Requests (2025–2026)

Action Item 1: Use Disaggregated SLO Data to Target Equity Gaps

Action Step:

Use disaggregated SLO assessment data to identify specific concepts, assessments, or instructional practices where equity gaps persist, and collaboratively develop inclusive teaching strategies through the department's CRAB (Culturally Relevant Activities in Biology) Community of Practice.

Rationale:

This data-driven approach allows for targeted redesign of instruction rather than generalized interventions, improving effectiveness and accountability.

Action Item 2: Sustain and Expand Equity-Focused Professional Development

Action Step:

Continue professional development in culturally responsive pedagogy, equitable grading practices, accessibility, and OER/ZTC material development through CRAB, EMTLI participation, and department meetings.

Rationale:

Faculty capacity-building has been central to closing retention gaps and must remain a sustained departmental priority.

Action Item 3: Hire a Full-Time Physiology Faculty Member (Bio 141 / Bio 141L) – CRITICAL

Action Step:

Hire a full-time Physiology (Bio 141 / Bio 141L) faculty member to replace a recent retirement.

Rationale:

Physiology is a high-enrollment, high-impact gateway course for allied health pathways. Without this hire, the department cannot sustain current enrollment levels or meet growing demand, which would disproportionately impact students of color pursuing healthcare careers and exacerbate equity gaps in access and completion.

Action Item 4: Increase Laboratory Technician Support – CRITICAL

Summary of Progress or Results

Action Steps:

- Reclassify the evening Biology lab technician position from 10-month to 12-month, and
- Convert the shared part-time Chemistry/Biology lab technician position to a full-time, 12-month position.

Rationale:
Expanded course offerings, increased lab complexity, and growth in evening, and summer sections have significantly increased lab preparation and maintenance demands. Adequate lab technician support is essential to maintain enrollment capacity, ensure safety, and support equitable student success in 100-level laboratory courses.

Action Item 5: Improve Access to Instructional Equipment in 100-Level Labs

Action Step:

- Purchase 4× objective lenses for all general biology microscopes used in Bio 120.
- Purchase plant signaling (spiker) boxes to support hands-on experimentation in physiology and plant biology labs.

Rationale:
The absence of 4× scanning lenses limits students' ability to learn foundational microscopy skills required for Anatomy and Microbiology. Plant spiker boxes support inquiry-based learning and conceptual understanding. Both requests directly address equity by ensuring all students have access to appropriate learning tools regardless of prior experience.

Action Item 6: Expand Embedded Academic Support

Action Step:
Continue advocacy for embedded learning assistants (ELAs), tutoring, and expanded STEM Center support in high-enrollment 100-level courses, particularly Anatomy and Physiology.

Rationale:
Embedded support has shown promise in improving persistence and narrowing equity gaps in gateway STEM courses.

Action Item 7: Learners' and Elders' Gardens (Expanded)

Action Step:
Advance development of the Learners' Garden, located near the H-building/science classrooms, to provide easily accessible, hands-on, culturally grounded learning spaces integrated into 100-level Biology coursework. Continued planning of Elders' Garden near Kumeyaay Village.

Rationale:
These gardens extend the success of the Kumeyaay Village model by providing high-visibility, place-based learning opportunities that foster belonging, relevance, and engagement key drivers of student success for historically underserved populations.

Action Item 8: Strengthen Communication with Counseling and Student Support Services

Action Step:
Improve coordination with Counseling to ensure students, particularly those from historically excluded backgrounds, are aware of academic, financial, and tutoring resources early in their biology pathways.

Rationale:
Clear, proactive communication supports persistence and reduces attrition in demanding gateway courses.

Summary of Progress or Results

Closing Statement

Together, these actions move the department from isolated equity initiatives toward a cohesive, structural equity framework. By aligning faculty staffing, laboratory infrastructure, instructional design, and culturally responsive pedagogy, the Biology Department is committed to sustaining gains in retention while closing remaining success gaps ensuring that students of color not only persist in 100-level Biology courses, but thrive.

Program Overview and Update

Lead Author
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Collaborator(s)
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Please briefly share the ways in which you collaborated with colleagues within and outside of your department to gather input to inform your program review.
The Biology Department gathered input for this Program Review through multiple collaborative structures. Program Review goals, data, and SLO/PLO assessment findings were discussed during Professional Development Week, as well as through the department's monthly Community of Practice (CRAB) meetings. Faculty were also invited to provide feedback through targeted email requests and follow-up conversations. Full-time Biology faculty contributed directly by reviewing draft sections of the Program Review and assisting with edits, additions, and refinement of the narrative.
In addition, Biology laboratory technicians were included in discussions related to instructional support, lab capacity, and resource needs. The department also engaged in collaborative conversations with colleagues from Physics, Engineering, Earth Sciences, Kumeyaay Studies, and Ornamental Horticulture to discuss interdisciplinary partnerships, shared student pathways, and strategies for supporting student success across STEM and place-based learning environments. These collaborative efforts ensured that the Program Review reflects a broad, integrated perspective on how the Biology Department can best serve students.

Dean/Manager(s)
Tammi Marshall

Please briefly share the ways in which you collaborated with your Dean on your program review to discuss your vision, goals, and resource needs/requests.

I worked closely with the Dean throughout the Program Review process through regular monthly meetings, as well as ongoing communication via email and phone as needed. Department vision, goals, and resource needs were discussed continuously during these meetings. A draft of the Program Review was shared with the Dean in November, and constructive feedback was provided and incorporated. This ongoing dialogue reflects a strong, supportive partnership focused on aligning departmental priorities with college goals and ensuring student success.

Program Reflection and Description

Provide your program's mission statement. If your program does not have a mission statement, what is your timeline for creating a mission statement?
Biology Department Mission Statement
Our mission is to cultivate a learner-centered environment that empowers all students through inclusive, culturally responsive teaching, diverse assessment methods, and real-world applications. We are dedicated to fostering curiosity, critical thinking, and resilience, while preparing students for academic advancement, meaningful careers, and lifelong engagement with the natural world. Through interdisciplinary collaboration and

personalized learning, we aim to inspire students to take ownership of their educational journey and to develop a deep, lasting connection to science, community, and the environment.

Biology Department Philosophy

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 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.

Biology Department Acronym

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

Biology Department Mantra

Empower Through Curiosity: Encourage students to explore diverse knowledge systems, fostering a lifelong love for learning and an empowered approach to new challenges.

Is the program description in the current college catalog up to date and accurate?

Yes

Describe how your program advances the College's vision of equity, excellence, and social justice through education. How does the program reflect the College's mission and values?

The Biology Department actively advances Cuyamaca College's vision of equity, excellence, and social justice through education by centering our curriculum, pedagogy, and departmental practices on inclusion, collaboration, and community relevance. Our work aligns deeply with the College's mission and values, particularly in fostering student success, belonging, and shared responsibility for equity.

We have re-envisioned our General Biology sequence (BIO 120, 130, 131) to better align with Grossmont College, ensuring seamless transfer pathways and equitable access to STEM majors across the district. This alignment is the result of new collaboration between the biology chairs at both colleges to promote student success and curricular consistency. The redesign intentionally integrates culturally responsive teaching practices, diverse and concept-driven assessment strategies, and Open Educational Resources (OER) to reduce financial barriers for students.

Our partnership with the Kumeyaay Studies Program exemplifies the department's commitment to honoring Indigenous knowledge systems and supporting place-based education. Faculty have developed and taught courses such as Kumeyaay Ethnoecology and Ethnobotany that connect modern science with Traditional Ecological Knowledge. We have collaborated on planning and implementing events in the Kumeyaay Village, including cultural burns, clean-up and tending days, and integration of student learning activities. In collaboration with Ornamental Horticulture, we are also planning Learners' and Elders' Gardens, designed to serve as restorative, intergenerational learning spaces that bridge biology, horticulture, and Indigenous

stewardship principles. Building on this foundation, we are expanding our interdisciplinary work through partnership with our new Earth Sciences faculty to integrate Oceanography and other Earth systems content into the Indigenous sphere of our blended science offerings. We refer to this approach as MAT Science (Modern and Traditional Science), a framework that connects contemporary scientific practice with Indigenous perspectives and language, including the Kumeyaay concept of *maat*, a Kumeyaay word that means both land and man, demonstrating the importance of the relationship between the land and people.

Within our department, we have cultivated a thriving Community of Practice (CRAB: Culturally Relevant Activities in Biology) that serves as a model for interdisciplinary equity work. Faculty and staff from across STEM and beyond collaborate to design inclusive teaching strategies, common assessments, and culturally relevant classroom activities. Members of our department have extended this commitment to the broader college community by co-chairing ROC, co-chairing the Student Success and Equity Council (SSEC), co-chairing Accreditation, and co-leading the Nuventive and Program Review redesign efforts. Through these leadership roles, Biology faculty have helped shape institutional structures that better support equity-minded assessment, transparent planning, and sustainable change across the college.

The department's equity focus extends to increasing access to major-level biology courses and addressing persistent equity gaps in retention and success. Through data-driven inquiry and collaboration, we have developed tutoring partnerships, coordinated lab schedules that meet students where they are and stressed a need for targeted supports such as embedded learning assistants. These efforts are complemented by our active engagement with student organizations like SACNAS and the Kumeyaay Science Club (E'Muht Mohay – "Love for the Land"), and the new Pre-Health Peers Club, which promote representation and community in science.

In these ways, the Biology Department not only reflects but embodies the College's mission to transform lives through learning, equity, and social justice. Our faculty lead with collaboration, cultural humility, and innovation, preparing students to thrive academically, engage meaningfully with their communities, and apply scientific understanding toward a more just and sustainable world.

Curriculum Review and Development

Have all of your active course outlines been reviewed within the last five years?
Yes

Please list any planned changes from the current semester forward for curriculum (courses, degrees, and/or certificates) and the rationale for those changes.
Planned Curriculum Changes and Rationale (from Fall 2025 onward):

1. **Merger of BIO 130 and BIO 131 into BIO 120 (General Biology for Health Sciences):**

    - **Rationale:** This change aligns our general biology prerequisite for allied health pathways with Grossmont College, improving articulation and transferability for students. The integrated BIO 120 course increases student success by enhancing interaction with instructors and aligning lecture and lab content within a single course. This cohesion supports a more holistic understanding of biology concepts for pre-allied health students.

2. **Redesign of BIO 130 as a Non-Majors GE Lecture Course:**

- **Rationale:** With the merger of BIO 130 and 131, the existing BIO 130 course will be revised to better serve students taking it solely for general education (GE) requirements particularly those in engineering and other non-biology majors. In collaboration with the Engineering Department, we aim to modify curriculum to be more appropriate, relevant, and engaging for these students by incorporating applied biological principles that connect to engineering contexts.

3. **Development of a New Marine Biology Lecture and Lab Course:**

- **Rationale:** This new non-majors GE offering will provide students with an engaging option focused on marine organisms and ecosystems. It will support interdisciplinary interests by aligning with Oceanography courses in the Earth Science Department and the Kumeyaay Studies Program. The course will also strengthen our partnerships with Scripps Institution of Oceanography and the T.I.D.E.S. program, and promote awareness of maritime science from Indigenous perspectives.

Please upload the 2-year course rotation(s)/schedule(s) for each associate degree covered by this program review.
Two-year Course rotation for Biology and pre-Allied Health

For Transfer Programs: How is your program meeting the transfer needs of students, and/or articulation with four-year institutions? If not a transfer program, please enter N/A

We are meeting transfer and articulation needs for Biology majors and pre-Allied Health majors through alignment with CSU and UC transfer pathways and established articulation agreements with four-year institutions. In addition, we are strengthening transfer preparedness by planning student-focused workshops during Professional Development Week that will help students review their educational plans, understand required course sequencing, and connect with a STEM counselor to ensure they remain on track for transfer and program completion.

Student Learning Outcomes (SLO) Assessment

Please upload an updated, current version of your SLO assessment plan. (Ideally, the updated plan should specify assessment semesters for all service areas over the next 4 years, between this comprehensive program review and the next.)
Program Review | SLO through the years 2021-2025

What do your course SLO data over the past 4 years suggest about student experiences, successes, and challenges in your service area?
Over the past four years, analysis of course SLO data in the Biology Department reveals a clear trajectory toward deeper, more authentic learning experiences and a more inclusive understanding of student success. As the department shifted from content-based to concept-driven and project-based assessments, students began to demonstrate stronger critical thinking, higher engagement, and greater confidence in applying biological concepts to real-world and culturally relevant contexts.
Across the department, SLO results consistently show that students perform best when learning is active, connected, and collaborative. Courses such as Kumy/Bio 134: Ethnobotany and Bio 240: Ecology, Evolution, and Organismal Biology, which use project-based learning and community-oriented assessments, consistently report success rates above 85–90%, along with evidence of meaningful student engagement and sense of belonging. Similarly, Bio 152: Paramedical Microbiology demonstrated high mastery across skill-based SLOs (≥80%), underscoring the value of applied, hands-on learning.

Comprehensive Program Review

At the same time, SLO data have highlighted ongoing challenges in foundational and high-enrollment courses, particularly Bio 130: General Biology and Bio 140: Anatomy. While most students meet individual SLO benchmarks, disaggregated data reveal persistent equity gaps in success and retention for African American and Latinx students. Department-wide reflection through our CRAB (Culturally Relevant Activities in Biology) community of practice has identified that traditional assessments were not effectively capturing the learning and growth of all students. In response, the department redesigned SLOs to emphasize conceptual understanding ("form determines function"), reduced the total number of SLOs for clarity, and implemented new equitable assessment strategies such as group projects, iterative feedback, and reflective metacognitive activities. These changes have resulted in more meaningful data and improved equity outcomes, particularly in Bio 130, where success rates for Hispanic/Latinx students rose from 59% to 70%, and for African American students from 68% to 79%. The implementation of open lab hours using anatomy models with anatomy tutors available, as well as collaborative learning activities have also improved access and student persistence in gateway courses.

Qualitative feedback from project-based assessments and SLO reflections suggests that students increasingly see biology as relevant to their lives, communities, and identities. Many express greater motivation when coursework connects to place-based, cultural, or applied scientific contexts. This outcome is strongly supported by the success of our Kumeyaay Science courses (Kumy/Bio 133, 134, 135).

Overall, the department's SLO data tell a story of growth, reflection, and transformation from compliance-based assessment to a genuine tool for understanding student learning and improving equity. While challenges remain in addressing preparation gaps and ensuring consistency across sections, our evolving assessment framework provides a clearer window into how students learn, where they struggle, and what practices help them thrive.

For a summary of SLO assessments for each biology course over the past four years, please review the attachment "Program Review | SLO through the years 2021-2025".

Share an example of meaningful, innovative, equitable, and/or student-centered SLO assessment happening in your program.

A powerful example of innovative and equitable SLO assessment in the Biology Department is the "Hopeful Monster Project" in Bio 240: Ecology, Evolution, and Organismal Biology. This project reimagines assessment as a creative and collaborative process, enabling students to demonstrate their understanding of evolution, physiology, and ecology through original scientific design rather than rote memorization or traditional testing.

In this assignment, students apply their knowledge of animal body systems and evolutionary principles to design a new organism capable of surviving in a specific biome. Working in teams, they integrate content from across the semester, evolutionary theory, comparative anatomy, and ecological adaptation, to create a plausible "hopeful monster." Students must justify each structural and physiological choice based on functional necessity and environmental pressures, demonstrating the relationship between form and function, one of the department's central conceptual SLOs.

This project exemplifies equitable and student-centered assessment in several ways:

- It values multiple forms of learning and expression, allowing students to demonstrate understanding through drawing, modeling, presentation, and collaborative discussion.
- It builds in peer-to-peer learning, as students critique and refine one another's designs, strengthening scientific communication and confidence.
- It shifts grading emphasis from isolated content recall to conceptual synthesis, creativity, and reasoning, which benefits diverse learners and reduces inequities tied to standardized testing styles.
- The project also connects to broader departmental themes of adaptation, interdependence, and belonging, encouraging students to see themselves as creators and problem-solvers within the scientific process.

Comprehensive Program Review

Faculty assessment data show that students not only achieve the targeted SLOs at a high rate but also demonstrate greater engagement and retention compared to prior exam-based approaches. The success of this model has inspired similar project-based, concept-driven assessments across other biology courses, including Bio 120 (Alien Cell Project) and Kumy/Bio 134 (Ethnobotany Community Projects).
Through this type of assessment, the Biology Department continues to transform SLO work into an authentic measure of learning, creativity, and equity, ensuring that all students, regardless of background, have meaningful opportunities to demonstrate mastery and connection to the discipline.

Discuss how your SLO data are being used for course and/or program improvements for student retention, success, and/or goal achievement.
The Biology Department uses SLO data as a catalyst for continuous improvement in curriculum, pedagogy, and equity. Over the past four years, SLO assessment results have directly informed course redesigns, department-wide initiatives, and cross-campus collaborations that strengthen student retention and success.
At the course level, SLO data revealed that traditional, content-heavy assessments did not accurately capture student learning or address equity gaps, particularly in Bio 130: General Biology and Bio 140: Anatomy. In response, the department streamlined and clarified SLOs, shifting to concept-driven and project-based assessments that measure higher-order thinking and application. For example, Bio 130 reduced six SLOs to one broad outcome “explain how form determines function” and piloted the Alien Cell Project, which increased engagement and comprehension while narrowing success rate disparities among student groups. Similarly, Bio 140’s SLO revision led to the integration of case study–based assessments and is evaluating targeted strategies to help students such as the need for embedded learning assistant (ELA), open-lab support models, and “at time” readiness modules integrated into Canvas in order to improve accessibility and preparedness for all students.
At the program level, aggregated SLO data have guided resource allocation and curricular sequencing decisions. Analysis of Bio 130 and Bio 140 outcomes prompted the department to explore correlations between where students complete prerequisites (Cuyamaca, Grossmont, or external institutions) and their success in subsequent courses. This finding informed the development of a support course proposal for Anatomy and spurred ongoing alignment of general biology curricula across Grossmont and Cuyamaca Colleges to promote equitable preparation districtwide.
Department-wide reflection on SLO data occurs regularly through the CRAB (Culturally Relevant Activities in Biology) community of practice. Faculty collaboratively review results, identify patterns of inequity, and co-develop interventions such as revised rubrics, metacognitive prompts, and culturally responsive lab activities. This process has resulted in more meaningful, consistent SLO data and improved faculty calibration across multiple courses.
Finally, SLO findings have been instrumental in program-level planning and goal setting. Trends from Kumy/Bio 134: Ethnobotany and Bio 240: Ecology, Evolution, and Organismal Biology, both of which use collaborative, project-based assessments, show that students who engage in creative, culturally relevant, and applied learning experiences persist at higher rates and demonstrate stronger conceptual mastery. These outcomes reinforce the department’s equity and retention goals and have informed new initiatives such as the Learners’ and Elders’ Gardens (with Ornamental Horticulture) and continued integration of Kumeyaay Traditional Ecological Knowledge into biology courses.
Through these intentional, data-informed actions, the Biology Department has transformed SLO assessment from a compliance activity into a powerful feedback system for continuous improvement, enhancing retention, narrowing equity gaps, and supporting students in achieving their academic and transfer goals.

Degree and Certificate Programs

For each degree and certificate indicate how many awards were conferred in the past five years. Please comment on any trends and provide context to explain any increases or decreases.

Degree Award Summary (5-Year Trends)

Degree counts vary by pathway and do not always reflect student participation or success. **BIO1 (Biological Sciences)** and **BIO3 (Marine Biology)** are primarily transfer-oriented pathways; many students complete major preparation and transfer to four-year institutions without applying for the associate degree, making transfer outcomes a more meaningful success indicator than degree counts. **BIO2 (Pre-Allied Health)** represents the highest-volume award pathway, reflecting strong demand for health-care careers, though some students prioritize prerequisite completion and program entry over formal degree attainment.

BIO1 – Biological Sciences | 5-year total: 34

Awards in this degree show small but fluctuating numbers over the five-year period, with a peak in 2020-21 and stabilization at lower levels in more recent years. However, this trend does not accurately reflect the number of students in the Biology major pathway, as most students in this track are preparing for direct transfer to four-year institutions. For these students, completing the associate degree does not meaningfully benefit their academic or career trajectory, and many choose to transfer once major preparation and general education requirements are satisfied rather than applying for the two-year degree. As a result, transfer success is a more meaningful indicator of pathway effectiveness than degree-completion counts for this program.

BIO2 – Biological Sciences: Pre-Allied Health | 5-year total: 120

BIO2 continues to represent the highest-volume award pathway in the department, with 120 degrees conferred over five years. Awards peaked in 2020-21 and 2021-22 and then declined and stabilized beginning in 2022-23. This trend reflects shifts in student behavior within competitive health-career pipelines: many students prioritize course completion and program prerequisites for entry into nursing and allied-health programs rather than formal degree attainment. Some students also transfer or enter selective-admission programs before applying for the associate degree. Despite the decline, demand for this pathway remains strong and closely aligned with regional workforce needs in health-care and laboratory-based careers.

BIO3 – Marine Biology | 5-year total: 1

Awards in Marine Biology are minimal, with only one degree conferred in the past five years. This pattern is largely attributable to the transfer-oriented nature of this pathway. Students pursuing Marine Biology typically complete lower-division major preparation at the college and then transfer to institutions that offer specialized upper-division coursework and field-based opportunities. As with BIO1, students frequently transfer prior to applying for the associate degree, meaning degree counts do not fully represent student participation or success in the pathway. The department will continue monitoring interest and advising patterns to ensure students clearly understand both transfer and degree options.

Please refer to Table 1 in the uploaded document "Program Review Data and Figures" page 5 for the raw data.

Indicate when each degree and certificate was last reviewed and updated (semester), if this information is available (e.g., via internal program records or Curriculum Committee minutes).

The Biology degree maps were reviewed and evaluated in Fall 2025, and they are currently being updated to align with new transfer and articulation requirements. This work is occurring alongside major statewide Common Course Numbering (CCN) changes, which will require us to revise degree plans again to reflect new course identifiers. Beginning in Fall 2026, the new CCN course names for Bio 120 and Bio 130 take effect and these courses will have a different prefix (BIOL) then the rest of the department courses. To ensure consistency and alignment within our department and across the district, a shift in our departmental prefix from BIO to BIOL is proposed for Fall 2027. The process for implementing this naming transition is still being determined, but it will have significant downstream impacts on degree maps for other departments and catalog language. When a formal curriculum process to make these changes is available, we will submit through the Curriculum Committee as appropriate.

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Earlier review dates for specific degrees are not readily available in department records; however, the current and upcoming update cycles reflect an intentional, ongoing effort to ensure that all Biology pathways remain clearly articulated, transfer-aligned, and consistent with state and district-wide naming and numbering standards.

Can students complete the degree/certificate requirements within a two-year period?
Yes

How is your program currently assessing its PLOs? Please select all that apply.
SLO-to-PLO Mapping

Please provide the following for each degree/certificate: • The most recent semester each of your program(s) assessed PLOs; • Brief summary of findings; and • Overview of changes made as a result.
In Fall 2024, the PLOs for Biology and pre-Allied Health programs were updated and approved by Curriculum. In Spring 2024, we discussed and developed a plan linking our current SLOs to our department PLOs. Click link for this plan for both Biology and pre-Allied Health. A number of the SLO assessments are capstone projects, such as the Hopeful Monster Project in Bio 240 for PLO 1 (Biology) and the unknown bacteria project in Bio 152 for PLO 2 (pre-Allied Health). We assessed all of our SLO by Fall 2025 in order to use this data to assess our PLOs for both degrees.
For the future, we are in discussion with other science departments to examine shared PLO Assessment across ACP.
Most recent semester assessed: Fall 2025 (Based on SLO-to-PLO mapping across the 2021–2025 assessment cycle).
Summary of findings:
The Biology Department conducted full SLO assessment coverage across all courses during the 2021–2025 cycle in order to intentionally align and evaluate progress toward program-level learning outcomes for biology and pre-Allied Health degrees. Faculty used mapped SLO evidence particularly from project-based, concept-driven, and inquiry-focused assessments to examine the extent to which students demonstrated competency.
Across courses, SLO assessment results indicate that students are consistently meeting the PLOs in both Biology and pre-Allied Health degrees, with the strongest evidence in areas related to conceptual understanding, application, and scientific communication. The transition to authentic, project-based assessments produced richer and more meaningful data than earlier recall-focused SLOs and better reflects true program-level learning.
For a full breakdown and analysis of the PLO-SLO mapping results by degree (Biology and pre-Allied Health), please refer to the uploaded document "PLO Assessment by Degree and SLO".

Are all of your degree maps completed?
Yes

Are the degree maps posted to the college website?
No

If you answered "No" above, what are your plans to publish the degree maps for your program?
The Biology degree maps have been developed, reviewed, and discussed collaboratively in meetings facilitated by the Dean with Counseling and MSE department chairs. The maps are functionally complete, and we are currently working with Counseling to finalize sequencing details and ensure alignment with transfer and advising requirements. Once this collaborative review is complete, the maps will move forward for publication.

How are you currently assessing your PLOs? If you are not currently assessing PLOs, what is your plan to assess PLOs in the future?
Our program assessed its PLOs in Fall 2025 through SLO-PLO mapping. During the Spring 2024 department-wide SLO meeting, faculty collaboratively reviewed and mapped course-level SLOs to our newly revised PLOs for both the Biology major and Pre-Allied Health pathways. Please refer to the uploaded documents for the PLO-SLO mapping and PLO assessment results.

In addition, we are working toward interdisciplinary PLO assessment across our ACP, recognizing that chemistry, physics, and mathematics are essential foundations for biology majors. We envision a more integrated, cross-departmental approach to PLO assessment in the future and are laying the groundwork for this during our next review cycle.

How are your PLO assessments informing improvements/changes to your program?

Overview of changes made as a result:

The SLO-to-PLO assessment process has led to several department-wide improvements, including:

- Revision of the PLOs, SLOs and assessments to emphasize conceptual understanding, inquiry skills, and equity-minded pedagogy;
- Expansion of project-based learning and integrative assignments (e.g., Hopeful Monster Project, ethnobotany community projects, BIO 152 and 230 research-analysis activities);
- Improved alignment between lecture and lab outcomes, especially in BIO 120, BIO 140/141/141L, and BIO 230;
- Development of curriculum and reflection practices through the CRAB community of practice; and
- Use of assessment data to inform resource requests (tutoring support, lab support, new or replacement models and equipment).

Student Access and Achievement

Please describe any enrollment changes (increases/decreases) over the past 4 years and the context for these changes.

Over the past four years, the Biology Department has experienced significant enrollment growth and recovery, reflecting both institutional trends and intentional departmental efforts to expand access, modernize curriculum, and meet community and workforce needs. Figures referenced can be found in the uploaded document "Program Review Data and Figures."

Between Fall 2020 and Spring 2025, total Biology Department enrollment (all courses combined) increased by approximately 38%, reflecting both post-pandemic recovery and strategic expansion of access.

- In Fall 2020, enrollment was at its pandemic-era low, roughly 850 students across all biology sections (down nearly 25% from pre-pandemic levels).
- By Fall 2022, enrollment had rebounded to around 1,050 students, with full restoration of Anatomy, Physiology, and Microbiology sections that had been temporarily suspended or capped.
- As of Spring 2025, total enrollment across the department averages around 1,175–1,200 students per term, exceeding 2019 pre-pandemic levels by approximately 10–12%.

As noted above, following a period of sharp enrollment decline during the pandemic (2020–2021), the department has not only rebounded but exceeded pre-pandemic levels in several key areas. Beginning in Fall 2021, the return to in-person instruction, combined with new hybrid and online options, led to steady enrollment increases across nearly all course levels. This growth has been most notable in major-level and pre-allied health courses (Bio 140, 141, 152, 230, and 240), which together account for the majority of the department's FTES. Enrollment in these courses

has risen consistently since Fall 2022, supported by districtwide increases in students pursuing nursing, pre-medical, and health-related transfer pathways.

Contextually, this growth reflects both local demand and strategic departmental planning. The Biology Department has taken proactive steps to align course offerings with student needs, including:

- Adjusting modalities and time offerings to improve access for working students and caregivers.
- Revising prerequisites and sequencing to better align with Grossmont College and streamline transfer pathways.
- Expanding high-demand courses such as Physiology, Anatomy, and Cell and Molecular Biology and restoring multiple-lab offerings that were previously limited by pandemic safety restrictions.
- Collaborating with Grossmont to ensure coordinated curriculum and scheduling.
- ACP outreach events

Enrollment has also increased in Kumeyaay Science courses (Bio 133, 134, 135) and other GE-level courses with a cultural or environmental focus such as Bio 122. These courses attract both STEM and non-STEM majors, driven by growing student interest in place-based, community-relevant, and sustainability-oriented learning. The integration of Indigenous knowledge systems and culturally responsive pedagogy has made these courses strong entry points for students historically underrepresented in STEM.

In contrast, Bio 130 (General Biology), a large gateway course serving both allied health and GE students, saw a temporary enrollment dip in 2021–2022 due to scheduling disruptions and pandemic-related lab limitations. Since 2023, however, enrollment has stabilized, aided by curriculum updates, aligned lab/lecture scheduling, and the shift to a more cohesive, concept-driven design that improves retention and student satisfaction.

Overall, between 2021 and 2025, the department's total enrollment has grown substantially, reflecting a healthy post-pandemic recovery and a shift toward equity-minded, flexible, and high-demand programming. This growth has been sustained by the department's responsiveness to student needs, its leadership in curriculum coordination across the district, and its commitment to expanding pathways for underserved and historically excluded populations in STEM.

Enrollment trends show steady post-pandemic recovery and improved access for Hispanic/Latinx and African American students, especially within 100-level coursework. The 100-level courses which include General Biology, Anatomy, Physiology, Microbiology, and Ethnobotany/Ethnoecology have maintained consistent growth since the return to in-person instruction. White students' proportional representation declined from roughly 45% in Fall 2020 to 35% by Spring 2025, while Hispanic/Latinx students rose from 28% to 36% and African American students from 6% to 8%. These changes reflect the department's intentional work to expand course modalities, align scheduling with student demand, and integrate culturally relevant instruction that resonates with diverse learners. These percentages now reflect the percentages of students who identify as Hispanic/Latinx and Black/African American at the college overall. Please see Figure 1 located in the Program Review Data and Figures attachment.

At the 200-level, comprising Cell & Molecular Biology, Ecology & Evolution, and Human Dissection, overall enrollment has also increased, but representation remains less balanced. Hispanic/Latinx students increased their share from 25% to about 31%, while African American students grew slightly from 1.2% to 1.7%. These small but consistent gains coincide with adding sections, but clearly more work needs to be done. Please see Figure 2 located in the Program Review Data and Figures attachment.

Together, these data show that while 100-level Biology courses are becoming more demographically representative of the student body, sustained work is needed to improve access to 200-level coursework. The department's efforts through CRAB-led innovation, collaborations, and inclusive curricular redesign are helping to close access gaps and build a stronger, more equitable pipeline from entry-level to major-level biology.

What is the program doing to increase student enrollment or access?
The Biology Department has taken a proactive, equity-minded approach to increasing enrollment and access by combining strategic scheduling, curricular redesign, outreach, and community partnerships. Working closely with the Dean, the department engages in data-driven schedule planning each term to ensure that course offerings align with student demand, transfer timelines, and equitable access goals. This collaboration has allowed for intentional expansion of high-demand courses (such as Anatomy, Physiology, and Cell and Molecular Biology), the addition of evening sections, and the alignment of the General Biology sequence with Grossmont College to support seamless student progression across the district.
To further broaden access, the department has partnered with the STEM Academic and Career Pathways (ACP) initiative to engage with local high schools and prospective STEM students, leading to increased Latinx participation in both allied health and biology major pathways. The department has also strengthened collaborations with Ornamental Horticulture and Kumeyaay Studies, planning community learning spaces such as the Learners' and Elders' Gardens and expanding field-based and culturally relevant learning opportunities.
Within the department, the CRAB (Culturally Relevant Activities in Biology) community of practice continues to advance inclusive teaching and assessment practices that promote student belonging and persistence. Combined with open lab hours, peer tutoring, and embedded learning assistants, these efforts have enhanced retention while expanding access to historically underserved student populations.
Together, these initiatives have contributed to a 38% overall increase in Biology enrollment since Fall 2020, with especially strong growth among Hispanic/Latinx and African American students in entry-level courses demonstrating the department's commitment to equitable access and responsive, student-centered planning.

What is your program's overall course success rate? How has it changed over the past 4-5 years?
Over the past five years, the Biology Department has demonstrated steady and significant improvement in student success, reflecting the department's deep commitment to equity, curriculum redesign, and student-centered instruction. All figures can be found on the uploaded document "Program Review Data and Figures".

Overall Departmental Success

- The overall course success rate increased from 63% in Fall 2020 to 78% in Spring 2025, a 15-point gain over the review period.
- This improvement closely parallels the department's equity-focused reforms, including project-based assessments, culturally relevant pedagogy, expanded tutoring, and collaborative professional learning through CRAB.
- Success gains are also correlated with higher retention (rising from 80% to 90%), suggesting that more students are persisting and completing courses successfully once enrolled.
- Please reference Figure 3 on the document "Program Review Data and Figures".

100-Level vs. 200-Level Courses

- 100-Level Courses (General Biology, Anatomy, Physiology, Microbiology, Ethnobotany/Ethnoecology) rose from 62% to 77% success, driven by redesigned assignments, clearer sequencing, and increased access to open lab hours and embedded support.

- 200-Level Courses (Cell & Molecular Biology, Ecology & Evolution, Human Dissection) maintained higher-than-average performance, increasing from 70% to 82%, reflecting strong student support and our pedagogical shift as a department.

Disaggregated Success (Equity Focus)

- Hispanic/Latinx students' success rate improved from 58% in Fall 2020 to 75% in Spring 2025, a 17-point increase, largely attributed to culturally relevant pedagogy, OER adoption, and increased course access.
- African American students' success rate showed the largest gain, rising from 52% to 75%, reflecting the impact of intentional mentoring, inclusive assessment practices, and strengthened classroom community.
- White students' success rate improved modestly from 75% to 83%, maintaining consistent high performance.
- These trends demonstrate a narrowing of historic equity gaps: the success rate gap between White and African American students dropped from 23 points to 8, and between White and Hispanic/Latinx students from 17 points to 8.
- Please see Figures 4 -6 on the document "Program Review Data and Figures".

Interpretation

The upward trajectory across all groups and course levels underscores the department's systematic, equity-minded transformation. Faculty collaboration through CRAB, alignment with Grossmont College, and data-informed scheduling with the Dean have created a cohesive, student-centered structure that supports both access and success. The department now has one of the most consistent success trajectories in the MSE community, with data showing that inclusive teaching and curricular coherence have produced measurable, equitable improvements for all students.

Which groups are experiencing equity gaps in your program for success rate and/or retention rate?

Over the past five years, the Biology Department has made measurable progress in closing equity gaps in both success and retention, particularly for Hispanic/Latinx and African American students. While gaps have narrowed substantially, African American students continue to experience the largest residual gap in success, and both groups remain slightly below the overall departmental average.

Success Rates:

From Fall 2020 to Spring 2025, Hispanic/Latinx student success increased from 58% to 75%, and African American student success from 52% to 75%, compared to 83% for White students.

- This represents significant improvement (a +17 to +23 point gain), but a residual equity gap of about 8 percentage points remains between White students and both African American and Hispanic/Latinx groups.
- These differences are most pronounced in gateway 100-level courses (General Biology, Anatomy, Physiology, Microbiology), where course load, academic preparation, and financial barriers disproportionately affect underrepresented students.
- Please refer to Figure 4 in "Program Review Data and Figures".

Retention Rates:

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- Retention has improved across all groups, reaching 90% for White, 88% for Hispanic/Latinx, and 88% for African American students by Spring 2025.
- The retention gap has nearly closed, with less than a 2% difference among groups, reflecting the impact of CRAB-led inclusive teaching, peer tutoring, open lab hours, and embedded learning assistants. Please refer to Figure 5 in "Program Review Data and Figures".

Interpretation:
Persistent, but shrinking, success gaps suggest that the department's ongoing equity initiatives (culturally relevant pedagogy, flexible scheduling, ZTC/OER adoption, and mentoring) are working. Continued progress will depend on expanding embedded supports in gateway courses and increasing representation of African American students in advanced coursework, where access remains limited (≈1.6% of 200-level enrollment). Please see Figure 2 in "Program Review Data and Figures".

What department/discipline (or institutional) factors may be contributing to these lower rates of success for these groups of students?

Factors Contributing to Lower Success Rates for Some Student Groups

Several interconnected departmental and institutional factors contribute to the lower, but improving, success rates for African American and Hispanic/Latinx students in Biology.

1. **Gateway Course Barriers (100-Level)**
   The majority of equity gaps occur in large-enrollment gateway courses (Anatomy, Physiology, Microbiology, General Biology), where students often face steep learning curves and high content volume. These courses demand extensive preparation time, lab skill development, and critical thinking under timed assessments, all of which can disproportionately affect students balancing work, family, or financial obligations.

2. **Math and Chemistry Preparation Gaps**
   Many students from underrepresented backgrounds enter Biology sequences with uneven preparation in quantitative and chemical reasoning skills. Because foundational knowledge in these areas is essential for success in Anatomy, Physiology,and Microbiology these gaps can hinder performance despite strong motivation and effort. We are working with Math and have been provided with "at time" Canvas modules to assist our students and help close these gaps.

1. **Time, Workload, and Resource Inequities**
   Biology courses often carry heavy lab hours and require expensive materials, even with OER adoptions. Students from lower-income backgrounds frequently work multiple jobs or commute long distances, reducing time for study and participation in office hours or tutoring. These structural barriers limit persistence, particularly for first-generation students.

2. **Representation and Belonging**
   Students from historically marginalized groups have reported a lack of representation in STEM role models and limited sense of belonging in traditional lab environments. While the department's CRAB (Culturally Relevant Activities in Biology) initiative and Kumeyaay Studies collaboration are improving this, systemic barriers to inclusion in STEM remain.

3. **Institutional Scheduling and Support Structures**
   Although coordination with the Dean has greatly improved scheduling equity, institutional constraints on lab space and staffing sometimes limit flexibility in course timing or section availability, particularly in Physiology and Microbiology, which fill rapidly. This can delay student progress and contribute to withdrawal or non-completion.

4. **Post-Pandemic Academic Recovery**
   Residual impacts from remote learning, especially in hands-on lab courses, continue to affect academic confidence and skill readiness. These effects have been most visible among African American and Latinx students, who were disproportionately impacted by pandemic-related economic and technological inequities.

Interpretation

While many of these factors extend beyond the Biology Department, the department has responded by redesigning gateway courses, integrating culturally responsive teaching, and collaborating across departments to improve student preparation and persistence. Continued work will focus on strengthening learning communities and wraparound supports, including the inclusion of embedded tutors to sustain equitable outcomes across all student groups.

How has this data shaped your comprehensive program review goals and action steps?

The recent data reaffirm the continued relevance of the Biology Department's existing goals of expanding access to underserved populations and reducing equity gaps in success and retention for students of color while also highlighting areas where these goals can evolve into more targeted, actionable next steps.

Our data show that while access has improved substantially, particularly for Hispanic/Latinx students, representation in 200-level courses and overall success for African American students remain areas of focus. The department's progress suggests that our strategies such as , our department community of practice (CRAB) for professional learning, inclusive pedagogy, and culturally relevant curriculum are effective, but now need to be scaled and sustained through structured support and expanded collaborations.

Moving forward, the department is considering refining its comprehensive goals to include the following action steps:

1. Deepening equity in outcomes by implementing course-level action plans using disaggregated SLO data to address specific barriers in gateway courses (e.g., Anatomy, Physiology, and Microbiology).

2. Strengthening the equity pipeline by increasing mentoring and bridge opportunities from 100-level to 200-level courses, particularly for African American and Hispanic/Latinx students.

3. Institutionalizing inclusive scheduling practices by continuing data-driven coordination with the Dean and across STEM departments to align course offerings, lab capacity, and student needs.

This data has therefore refined, not replaced, the department's goals, confirming that our direction is sound, but our next step is to go deeper: to transform successful practices into sustainable, systemic structures that ensure equitable outcomes for all students.

Discuss your department/discipline's plan for diversifying department faculty in alignment with the GCCCD Board Resolution 20-015.
The Biology Department approaches faculty diversification through the lens of equity, excellence, and belonging, recognizing that diversity is not a quota but a strength that enriches the learning environment for all students. Our goal is to ensure that hiring, onboarding, and mentorship practices reflect the district's commitment to inclusive excellence while maintaining the highest standards of professional and academic merit.
In recent hiring cycles, the department and Dean have emphasized equity-minded recruitment practices, such as:

- Marketing the position in platforms that specifically target diverse communities such as SACNAS, AISES, and HERC
- crafting position announcements that highlight the college's mission of social justice and community relevance;
- engaging diverse hiring committees trained in equity-minded evaluation;
- valuing lived experience, community engagement, and culturally responsive pedagogy as dimensions of teaching excellence.

Our ongoing plan focuses on cultivating a department culture where all faculty thrive, rather than tokenizing representation. This includes continued participation in the college's equity and professional learning programs (e.g., CRAB, EMTLI), and building mentorship networks that support new and part-time faculty in integrating inclusive, student-centered practices.
The department's commitment to diversifying faculty is therefore rooted in a broader philosophy: to hire and nurture educators who reflect, respect, and uplift the diverse communities we serve because representation and excellence are inseparable.

What other qualitative or quantitative data, if any, is the department/discipline using to inform its planning for this comprehensive program review?
In addition to disaggregated enrollment, success, and retention data, the Biology Department has relied on a variety of qualitative and quantitative evidence sources to inform planning for this comprehensive review.

- **Quantitative:** Multi-year SLO assessment results and success data by course level were analyzed to identify patterns in gateway course performance and impacts of modality changes. Equity data disaggregated by race/ethnicity, along with section-level enrollment trends and FTES growth, guided planning for scheduling and resource allocation.
- **Qualitative:** Department discussions through the CRAB and SEED communities of practice provided context for understanding why certain student groups experience barriers to success. Faculty reflections on pedagogy, student feedback from lab activities, and campuswide collaboration (with Counseling, Ornamental Horticulture, and Kumeyaay Studies) further shaped departmental priorities.
- **Institutional Collaboration:** Coordination with the Dean and other MSE departments using shared planning tools (e.g., AirTable scheduling data) provided an integrated view of student flow across STEM disciplines.

Together, these sources provided a holistic picture of student experience, blending data trends with faculty and student insight, to ground the department's planning in both evidence and lived experience.

Attach Related Documents - Student Access and Achievement

Program Review Data and Figures

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?

The Biology Department ensures that Regular and Substantive Interaction (RSI) is consistently implemented across distance education courses through intentional course design, structured communication practices, and ongoing faculty engagement with students.

Faculty use purposeful Canvas course design with clearly organized weekly modules, expectations, and learning activities to support consistent interaction throughout the term. Even in courses that are 100% online, instructors include a synchronous Zoom component (e.g., scheduled class meetings,or review sessions) to provide opportunities for real-time engagement, clarification, and collaborative learning.

Instructors maintain ongoing instructor–initiated contact through:

- Weekly announcements that preview learning objectives, remind students of deadlines, and re-engage students who may be falling behind
- Prompt and substantive feedback on assignments, quizzes, labs, and projects that supports student progress and reinforces course learning outcomes
- Discussion-based and interactive learning activities that require student participation and instructor follow-up
- Regular check-ins and communication messages to encourage persistence and offer support resources when needed

RSI expectations are reinforced through department collaboration and peer mentoring, including discussions during department meetings and PD sessions focused on Canvas design, engagement strategies, and equity-minded online teaching.

Through these combined practices, the department ensures that online biology courses provide meaningful instructor presence, timely guidance, and academically substantive interaction, consistent with federal and accreditation standards.

If there are differences in success rates for distance education (online) versus in-person classes, what will the program do to address these disparities? If there are no differences, what did the program do to achieve that?

When comparing success and retention across instructional modalities, we analyzed the combined multi-year totals rather than evaluating individual semesters in isolation. Because the number of students enrolled in on-campus sections is significantly higher than all other modalities combined, using the aggregated dataset provided a more meaningful and stable comparison across modalities. Please review Figures 7 and 8 on the Program Review Data and Figures Document.

The combined-semester analysis shows that success and retention rates across modalities are generally similar, with only modest variation between on-campus, 100% online, and hybrid formats. This suggests that the department has been largely successful in maintaining consistent learning quality and support structures across modalities. Faculty attribute this consistency to intentional practices such as:

- Aligning assessments and learning outcomes across course formats,
- incorporating active-learning and concept-based pedagogy in both online and in-person sections,

- increasing transparency in expectations and grading structures, and
- providing students with structured support resources in Canvas and a synchronous component to every online course, whether it be in person or over Zoom.

Although differences are relatively small, the department remains attentive to modality-related equity considerations. We will continue to monitor success data and will strengthen online-student support where needed by expanding instructor communication practices, reinforcing community-building opportunities, and ensuring equivalent access to learning tools and engagement opportunities.
Overall, the current results indicate that the program has been effective in achieving parity in student outcomes across instructional modalities, and ongoing assessment will continue to guide improvements.

Career Exploration and Program Demand (Career Education Programs Only)

Is your program a career education program (e.g., does it prepare students to directly enter the workforce)?
No (Skip to the question at the end of this section starting with "What do the latest labor market data reveal ...")

What do the latest labor market data reveal about the careers (including those for transfer students) for which your program prepares students?
Labor Market Alignment for Biology Program Pathways
Latest labor market data indicate that Biology and related health science pathways prepare students for careers with strong demand and competitive earnings. Graduates with biological science preparation are employed across healthcare, scientific research, environmental science, and related fields. Nationwide, employment in biology-related occupations exceeds 3.5 million, with a median annual wage of approximately $75,000, though earnings vary by occupation and level of education.
Click link for labor market information from the U.S. Bureau of Labor Statistics.
100-Level Pathway: Allied Health Careers
The program's 100-level Biology pathway primarily supports students pursuing allied health and applied healthcare careers, including clinical laboratory technicians, medical assistants, nursing pathways, and other health-related professions. Labor market projections show that healthcare occupations overall are expected to grow faster than the average for all occupations, with nearly 1.9 million openings per year driven by growth and replacement needs. Healthcare practitioners and technical occupations have median annual wages above the overall occupational median, underscoring sustained demand for workers prepared through allied health pathways. Click link for labor market information from the U.S. Bureau of Labor Statistics
At the state level, California's Employment Development Department projects that the Education and Health Services sector which includes many allied health and biology-related occupations will be among the fastest-growing industries through 2033, with tens of thousands of new jobs statewide. This growth is driven by demographic change, healthcare access needs, and ongoing workforce shortages, reinforcing the value of associate-level and transfer-aligned preparation in these fields.
Click link for labor market information from EDD of California

200-Level Pathway: Biology Major and Transfer Careers
The program's 200-level Biology pathway prepares students for transfer into four-year programs and careers requiring advanced scientific training, including biological scientists, medical scientists, physicians, dentists, and research professionals. These careers typically require bachelor's, master's, or doctoral degrees and are associated with higher long-term earning potential and leadership roles in science and healthcare.

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Regionally, San Diego is a major hub for life sciences research and biotechnology, providing strong opportunities for students completing upper-division Biology preparation. The region's life sciences industry employs approximately 76,000 workers, includes nearly 2,000 life science companies, and generates roughly $56 billion in economic output, reflecting sustained demand for highly trained scientific professionals in research, biomedicine, and biotechnology (Bicom California Economic Impact report, 2023).

This ecosystem includes research institutions and employers in biotechnology, pharmaceuticals, genomics, and medical research that employ scientists, research associates, and technical specialists with advanced biological training. These opportunities align closely with the analytical, laboratory, and scientific reasoning skills developed in 200-level Biology coursework and transfer pathways.

Summary

Taken together, the latest labor market data confirm that the Biology program supports distinct but complementary career pathways: applied healthcare and allied health careers through the 100-level sequence, and advanced scientific, research, and professional careers through the 200-level Biology major pathway. Both pathways align with areas of sustained workforce demand and offer students viable routes to economic mobility and long-term career growth.

Strengths, Challenges & External Influences

Please describe your program's strengths.

Program Strengths:

1. **Comprehensive and Articulated Curriculum:**
   The Biology program offers a robust set of courses that serve both major and non-major students, including pre-allied health, biology transfer, and general education pathways. Recent curriculum alignment efforts with our sister college (e.g., the creation of BIO 120) enhance articulation, reduce redundancy, and improve student success and transfer readiness.

2. **Commitment to Equity and Student Success:**
   Our department is deeply engaged in equity-minded teaching practices. We regularly assess disaggregated student success data, pilot interventions to reduce equity gaps, and provide professional development for faculty focused on inclusive pedagogy, culturally responsive teaching, and equitable grading.

3. **Interdisciplinary and Culturally Relevant Offerings:**
   Courses such as Kumeyaay Ethnoecology and Ethnobotany integrate Indigenous knowledge with scientific frameworks, supporting both STEM majors and students in the Kumeyaay Studies program. These unique offerings foster cultural relevance, broaden participation in science, and strengthen connections with local Indigenous communities.

4. **Innovative and Engaging Laboratory Experiences:**
   Our lab-based courses emphasize inquiry-based and hands-on learning. Faculty develop creative and accessible lab activities that align with real-

world applications and emphasize critical thinking and scientific literacy.

5. **Collaborative and Student-Centered Faculty:**
   Our department values collaboration, both among faculty and with other departments and programs (e.g., Engineering, Earth Sciences, Kumeyaay Studies). Faculty regularly engage in curriculum coordination, shared assessment design, and student support efforts. Many also serve as advisors, mentors, and club sponsors, fostering a strong sense of community for students.

6. **Strong Growth and Responsiveness to Student Demand:**
   The Biology program has seen significant growth since the pandemic, especially in major-level and pre-health courses. We have responded by expanding section offerings across modalities and times, and by adjusting curricula to better meet student needs and reworking general education science options.

Please describe your program's challenges.
Program Challenges:

1. **Persistent Equity Gaps in Student Success and Retention:**
   While the department is actively engaged in equity work, disaggregated data continue to show lower success and retention rates for African-American students and other historically underserved populations, particularly in gateway courses such as BIO 140 and BIO 141. Ongoing efforts are needed to implement targeted interventions, build culturally responsive curriculum, and foster inclusive classroom environments.

2. **High Demand and Limited Capacity in Major-Level Courses:**
   As enrollment continues to grow especially in biology pathways serving allied health and STEM majors, meeting demand with existing faculty, lab space, and budget presents a challenge. This includes ensuring access to courses like microbiology, (Bio 152) physiology (BIO 141/141L), which fill quickly and require intensive lab support.

3. **Cost and Sustainability of Lab-Based Instruction:**
   Lab courses are resource-intensive and have been impacted by inflation and increased enrollment. Current budgets do not always keep pace with rising costs for lab materials, models, equipment, and maintenance. Sustaining quality hands-on experiences under these constraints is an ongoing challenge.

4. **Curriculum and Pathway Complexity:**
   As we realign and update courses (e.g., merging BIO 130/131 into BIO 120, redesigning BIO 130 as a GE lab for engineers), it can be challenging to communicate changes clearly to students, counselors, and faculty across disciplines. Careful planning and communication are essential to avoid

confusion and ensure smooth transitions.

5. **Faculty Workload and Leadership Demands:**
   Ongoing curriculum development, outcomes assessment, equity initiatives, and departmental coordination require significant faculty time and effort. Balancing these responsibilities with teaching loads and institutional service can lead to workload strain, particularly for full-time faculty in leadership roles.

Please describe external influences that affect your program (both positively and negatively).
External influences continue to shape our program in both positive and challenging ways. On the positive side, strong regional workforce demand in health, biotechnology, and environmental science fields continues to drive high enrollment and student interest in our biology courses. Local employers and transfer institutions consistently emphasize the need for graduates with strong laboratory, quantitative reasoning, and applied problem-solving skills, which reinforces the relevance of our curriculum and supports our students' employment and transfer prospects. Growth in health-related careers including nursing, allied health, public health, and laboratory sciences has also strengthened partnerships with regional universities and industry, creating clear pathways from our program into high-demand, living-wage professions.
At the same time, emerging federal policy discussions present potential challenges for our students. The Department of Education has recently considered changes that will exclude some health-related degrees from the classification of "professional degree programs," which could reduce or restrict federal student loan eligibility and borrowing limits for students pursuing these pathways. Additionally, the continued rise in cost of living across our region negatively impacts students' ability to focus on their studies, as many are required to balance coursework with increased work hours, housing instability, and family responsibilities.Because a large proportion of our students come from historically underserved and economically marginalized communities, policy shifts that increase financial barriers disproportionately threaten access, program persistence, and degree completion. These external financial and regulatory pressures create uncertainty for students preparing for careers in nursing and other health professions and may negatively impact enrollment stability and equity outcomes in our program.

Given these factors, what opportunities exist for the service area to advance the College's goals in the next 4 years?
Given these external influences, the Biology program has several significant opportunities to advance the College's institutional goals in the coming years. Continued regional workforce demand in health and STEM fields positions our program to strengthen career-aligned pathways, particularly for students pursuing nursing, allied health, environmental science, and biotechnology. By deepening partnerships with local universities, employers, and community organizations, we can expand work-based learning experiences, internship pipelines, and transfer alignment supporting the College's goals around student completion, living-wage employment, and equitable economic mobility.
There is also an opportunity to further integrate culturally responsive, place-based, and interdisciplinary teaching through our collaborations with Kumeyaay Studies, Earth Science, and community partners. These efforts framed within our MAT (Modern and Traditional) science approach advance the College's commitments to equity, inclusion, and culturally sustaining curriculum while strengthening student engagement and sense of belonging in STEM pathways.
In response to potential federal financial-aid and regulatory changes affecting students in health-related programs, the department also has an opportunity to proactively support student persistence by expanding advising partnerships, promoting early course sequencing, and advocating for financial and academic support for disproportionately impacted students. By aligning program design, scheduling, and student services with these emerging needs, the service area can help mitigate barriers, stabilize enrollment, and promote equitable access to high-demand career pathways.

Program Goals

Submission

Dean Approval and Feedback

I have reviewed the program review with the author and provided feedback.
Yes - Review and feedback complete

Feedback
The Biology Department has been working incredibly hard and this comprehensive program review is definitely a reflection of that.
- The department mission and philosophy statement are an embodiment of how the department has grown over the years. They are a strong advocates for the college's mission, vision, and values and believe strongly in equity, excellence and social justice for all.
- The collaboration across other departments and leadership throughout the college are clear indicators of the work this department has done over the last few years to not just grow their department, but the college overall.
- There is one COR that has not been reviewed in the last 5 years because they were waiting for a full-time hire in Earth Sciences to collaborate. That person is here and my hope is this will get worked on over the next year.
- The work on SLO assessment is amazing and is a shining example across the college. The Hopeful Monster Project explained also helps students identify with their own cultures and backgrounds as they problem solve and connect to the material learned throughout the semester.
- The growth in the Biology Department is nothing short of extraordinary! Several classes fill and have wait lists within a few weeks of registration starting. Already for spring 2026, they have an 96% fill rate.
- The increase in retention and success rates along with the narrowing of achievement gaps shows a commitment of the department to work on these improvements.
- What an amazing statement - "The department’s commitment to diversifying faculty is therefore rooted in a broader philosophy: to hire and nurture educators who reflect, respect, and uplift the diverse communities we serve because representation and excellence are inseparable."