



Fullerton College

Self-study for Biology Program

2025

Section 1: Introduction

1. Briefly describe your program, make sure to include how your program helps the College achieve its mission.

The Department of Biology is dedicated to serving all community members by providing equitable access to curriculum capable of transforming the lives of all students. We help our students to appreciate the breadth and significance of the life sciences and motivate them to contribute to the future of biology, medicine, biotechnology, allied fields, and society.

Our curriculum is an important component of Fullerton College's mission. By promoting inquiry, intellectual curiosity, ethical and professional standards, and critical thinking through the scientific method, our department is providing all students from diverse communities with the skills necessary to attain their career and educational goals while achieving degrees, certificates, and transfer. Our curriculum provides a solid foundation for students to become lifelong learners and to enter the high-tech workforce, and we augment our efforts by leveraging resources such as embedded tutors, experiential learning via internships and research collaborations, boot camps, workshops, seminars, the STEM Center, and the MESA Program.

We contribute to students' understanding and appreciation of diversity by elucidating the biological mechanisms that generate diversity, providing an up-to-date curriculum that highlights innovation and progress, and encouraging a growth mindset. We hold ourselves and our students to the high standards of academic achievement, ethics, and integrity that are necessary for scientists, and we are dedicated to improving the scientific literacy of our community. Ultimately, our goal is to train our fellow community members and future colleagues.

Section 2: Students

2.1 Student Demographics and Enrollment Trends

1. Using the data provided by the OIE, describe the student population your department serves. Which demographic groups have the most enrollments in your program? Which student groups are underrepresented in your program? Has the demographic profile of your program changed over the last four years?

Latin/o/x/e students made up 59% of the student body in 2024-2025, followed by Asian (14%), White (12%), Two or more races (11%) and Black or African American (2%). Only 35% of our 1,603 students identified as male. In the last four years, while the proportion of males has decreased ~3%, Latin/o/x/e student enrollments are stable, Asian students have decreased by ~5%, White student enrollments are stable, Two or more race students have increased slightly (+~2%), and Black or African American student enrollments are stable.

The ethnicities with the lowest representation are Native Hawaiian or Other Pacific Islanders and American Indian or Alaska Natives. Native Hawaiian or Other Pacific Islanders are listed in the data charts as >6 persons during the 2020-2025 timeframe, while American Indian or Alaska Natives reached their maximum of 5 persons this year.

Focusing only on courses that satisfy a requirement for the major or certification while excluding GE and courses for non-majors does not generally alter the order of ethnicities, with Latin/o/x/e students making up the majority of the population followed by Asian students.

2. Briefly describe course-level enrollment trends in your program over the past five years. Have the enrollment trends in your program changed over the last five years? To what do you attribute any changes or lack of changes?

Historically, maximum enrollment was observed before 2020. Since then we have made concerted efforts to recruit more students by hosting open house days, attending campus events and college career fairs, generating flyers, promoting via an active social media presence, and engaging in other

outreach activities. We are also working with Campus Communications on an improved departmental website.

Among our nonmajors' or GE courses, the BIOL 100 (Principles of Biology) lecture course shows the strongest increase in enrollment, having exceeded its 2020-era figure in 2024-2025. Demand for BIOL 101 (General Biology), which includes a lab component and thus meets more GE requirements, remains strong and has risen moderately since 2022-2023; BIOL 101H (Honors) enrollment is comparable to 2020 levels. We lost two instructors for BIOL 102 (Human Biology) but have replaced them and the enrollment trend is upward. BIOL 109 (Biotechnology and Genetics in Society) is offered as an online elective mostly to biotech-pathway students; enrollment reflects that some certificate-seeking students tend to take BIOL 190/190L instead. BIOL 190 (Introduction to Biotechnology) is a biotech certificate pathway course that also meets GE requirements and is offered as a dual enrollment and summer option; enrollment is stable with a moderate increase since last year. BIOL 190L, the laboratory companion course, has tripled in enrollment from 2021-2022.

Enrollment in the core biotechnology certificate courses reflects sharply increased interest in the curriculum for the first of three stackable certificates; for example, in addition to the increase in BIOL 190L demand, dashboard data indicate BIOL 191 (Basic Laboratory Skills) enrollment doubled since 2021. BIOL 192 (Protein Biochemistry) enrollment has fluctuated but dashboard data indicate it was at ~2020 levels at the start of Fall 2025; the trend is similar for BIOL 193 (Nucleic Acids). Among the courses required for higher-level certificates, BIOL 194 (Quality Control/Assurance in the Life Sciences) shows the strongest growth. BIOL 196 (Tissue Culture) enrollment trends remain constrained by the limited size of the tissue culture room; safety and practical concerns currently limit section size but we anticipate opening the course to more students when the new CTE/STEM building is completed.

The gateway course to the major, BIOL 170 (Organismal Biology), shows steady enrollment and as mentioned elsewhere our data indicate we will be severely impacted if faculty shortages prevent us from offering ~6 sections every semester, since BIOL 170 is a prerequisite for the 200-level majors' courses. Requirements for 200-level courses vary by degree (AA vs. AS vs. AS-T) and also by intended transfer target (CSU vs. UC). Although BIOL 276 enrollment has declined from earlier levels, BIOL 272 enrollment reflects recovery and remains strong, as does enrollment in BIOL 274. Enrollment in BIOL 297 benefits from collaborations with nearby academic laboratories, healthcare providers, and biotechnology corporations, and from our own faculty-led projects.

We attribute the steady increase in enrollment to initiatives that have reemphasized the benefits of a college community atmosphere and in-person interactions, and to requirements by the transfer institutions that, mirroring our own majors' and certification courses, require in-person laboratories. Our own outreach efforts remain committed and frequent; for example, by leveraging faculty experience and grant funding we have hired current and former students to present information about our department, courses, degrees, and certificates to their peers in a relatable

and accessible manner that promotes prospects, equity and community. Furthermore, it is our hope and intention that the recently-launched STEM Center coupled with increased awareness of the significant opportunities afforded them under the aegis of the MESA Program will provide our students with a space on campus in which they feel a sense of belonging.

In parallel we have sought to increase collaborations with other institutions for internships and research projects so that our students receive enhanced empirical learning opportunities and our department expands its connections. Another positive factor is our active pursuit of local high school partners to whom we offer dual enrollment courses and a dual enrollment pathway from high school to FC and beyond.

3. How do you monitor and modify course offerings, including time and modality, to ensure that students' needs are being met?

Our previous Self-Study documents and annual updates reflect our consistent monitoring of enrollment trends. This ongoing monitoring is informed by OIE data and instructor-initiated student surveys. Furthermore, we closely examine waiting lists to determine the number and scheduling of offered sections.

To ensure we are addressing demand for our courses and to inform our scheduling decisions, we independently and on our own initiative requested and leveraged OIE data to investigate whether prospective students attempted to enroll but were dissuaded by waiting lists as well as other enrollment trends. To do so we requested quantification and assessment of unique visits to the enrollment platform via individual IP addresses. The data we obtained are disaggregated by course, and allow us to examine the number of unique enrollments, number of unique waitlist placements, how many of the waitlisted students later enrolled, how many were initially denied waitlisting due to a full list but later joined the list, and how many students were initially denied waitlist access, joined later, yet did not enroll. Our greatest demand is for BIOL 101 (brief sample data: 354 unique enrollments, 180 waitlisted, 75 enrolled from the waiting list), followed by BIOL 102, BIOL 100, and BIOL 170 which is the gateway course to the major.

We offer expanded modality options for those courses with curriculum that is appropriate for hybrid (BIOL 101, 190) or asynchronous remote (BIOL 100, 102, 109) instruction. We offer majors' and non- majors' courses in the evenings and on Fridays to accommodate working and non-traditional students. We also offer courses off campus for dual enrollment students, and during Summer.

Since our students take required courses in chemistry and physics, we work with our colleagues in those departments to ensure our respective schedules allow students to complete their pathway in the recommended timeframe. We also obtain direct feedback from students in specific pathways. For example, we schedule courses in the BIOL 200-series in a manner that allows students to

complete their CHEM 11x and PHYS 2xx prerequisites, corequisites, and transfer requirements without scheduling conflicts by discussing our schedule with colleagues from the other two departments and getting feedback from or surveying students in the major.

2.2 Student Achievement

1. Using data provided by the OIE, describe overall student achievement counts, rates, and trends in your program over the past five years, these include: course success rates, degrees/certificates completion counts, transfer counts, licensing, job placement, wage improvements (not all of these measures apply to every program).

Assessment and discussion of student achievement and success rates, particularly through the lens of equity-minded growth, is an ongoing and significant process in our department. We consider all student outcomes important and recognize that each data point represents a member of our community whose education we value.

Cumulative success rates have exceeded the campuswide institution set standards during 4 of the last 5 academic years examined and currently remain above standard with an upward trend since 2022. Hybrid, online, and in-person modalities all currently exceed institutional standards and have increased since 2022-2023. BIOL 100, 101, 109, and 170 success rates have increased since 2020. Among these, BIOL 170, the majors' gateway course, is the most challenging. We have used boot camps and embedded tutoring for all BIOL 170 sections, and we continually stock the STEM Center and Academic Support Center with lab resources for use outside of class in order to better equip our students. The 2024-2025 success data are the highest in the last 5 years. BIOL 102 success rates also reflect a challenging curriculum but have increased steadily since 2022. We are exploring potential effects of modality on student success outcomes.

The biotechnology certificate courses attract diverse students including non-traditional, returning workers, and dual enrollment. BIOL 190 success rates are stable at over 70% since 2023 and are assisted by tutoring resources plus materials available outside of class for student review. We attribute the high success rate of BIOL 191 to the hands-on learning experience that simulates a real-world, working laboratory environment in which students are immersed. Instructors emphasize guiding students to discover and utilize their creativity, practical skills, and resourcefulness. BIOL 192, 193, 194, and 196 have very high success rates; these courses have smaller class sizes and attract more experienced students either advancing their biotechnology education or returning from industry to expand their skillsets, and the prerequisites tend to prepare students well for success.

BIOL 200-series courses are for majors who have completed BIOL 170. BIOL 272 and 274 success rates remain consistently above the Institutional Set Standard; we credit careful student preparation and coordinated instruction coupled with enhanced resources and experiential

learning. BIOL 276 success rates have been above target during 4 of the 5 academic years examined since 2020. BIOL 297 success rates are among the highest of all BIOL courses; student interns are acting professionals in a discipline-specific workplace.

Certificate awards have increased consistently since 2020, peaking in 2024–2025. Degree awards also increased, with 33 degrees and 45 certificates granted in 2024–2025. Transfer rates for students who earned an Associate’s degree have increased 13% since 2020. Most students require over 3 years to complete a degree. Accordingly, we have established 2-year and 3-year pathways so our students know their options. The available data indicate that the number of students who require 6 or more years has decreased since 2020.

Our department trains future biologists but also future physicians, nurses, dentists, clinicians, and biotechnology professionals, and we offer both STEM/CTE certificates and AA/AS(-T) degrees. We remain informed regarding wage improvements and the industry in general by being members of Orange County Biotechnology Education (OCBE), by maintaining professional and institutional relationships with nearby universities, through graduate feedback, and through datasets and analyses such as those provided annually by Biocom. The 2025 Biocom Life Science Economic Impact Report (<https://www2.biocom.org/l/54352/2025-06-18/n6h2pc>) provides detailed information on our sector and is positive when discussing the career outcomes of life science professionals in our state. Briefly, the life sciences have a major impact on the state’s economy and our region is a biomedical hotspot that continues to offer employment opportunities in therapeutics, clinical settings, R&D, and the nascent green economy despite global fiscal fluctuations.

-
2. Are there student groups whose success rates are below the institution-set standard or whose success rates are below other student groups? What factors can explain this?

American Indian or Alaska Native students achieved the Institutional “Stretch Goal” (80%) during the time period examined, while Asian students approached that goal (75%). White students, Black or African American students, and Two or more races students all met the institutional standard, while Latina/o/x/e students were very close. Native Hawaiian or Other Pacific Islander students did not meet the 62% goal.

Factors that may explain these outcomes could include socioeconomic, current political, and/or educational influences. Some students may not have the resources to devote themselves fully to their studies; others may not yet be fully prepared for the rigor and workload of a STEM curriculum. External demands and concerns, such as the economy and political uncertainty affecting many community members and their families, may also contribute.

-
3. In terms of your degree and certificate completers, are there any groups who are

underrepresented in your completion data compared to the overall enrollment in your program?

Latina/o/x/e students are the largest group completing degrees and/or certificates. The other two largest groups earning degrees are Asian and White students, followed by Two or more races and Black or African American students. Awards by ethnicity tend to reflect overall enrollment by ethnicity; we note some differences in gender, *e.g.* the number of male Latina/o/x/e students who complete a degree is lower than their female peers. The groups that are smallest numerically remain Native Hawaiian or Other Pacific Islander and American Indian or Alaska Native students. Overall the available completion data tend to reflect the general student body demographics.

4. Are your students completing your degree and certificate program requirements in the expected time frame? Are there certain groups whose rates are below other student groups? Discuss any efforts to improve time to completion.

The available data indicate that the average time to complete a degree is 4+ years. Latina/o/x/e students exceed the overall average by ~6 months, followed by White students, students of unknown race, and Asian students who are below the average. The fastest time to graduation is recorded by students of two or more races.

Our degrees require courses in chemistry, physics, and mathematics in addition to biology courses, and the timeframe and course sequence is affected by courses from outside our department. Moreover, the requirements for course articulation with neighboring UCs or CSUs are not consistent. Students may take more than the required number of courses in order to keep their options open for acceptance to multiple transfer institutions. Students may also face delays because they take fewer courses concurrently, increasing degree completion time to ensure a potentially higher GPA, which is vital if they are to gain entry into highly competitive professional schools.

To improve time to completion, we have established clear 2-year and 3-year pathways that distinguish between CSU and UC requirements. We coordinate our course offerings with other departments, we offer courses in the evenings and on Fridays, and we offer curriculum appropriate for remote instruction in a hybrid or online format.

2.3 Student Learning Outcomes

1. Describe your program's processes and practices for defining, assessing, and analyzing student learning outcomes at the course (CSLO) and program (PSLO) level. Include a discussion of how your program uses the results of CSLO/PSLO data to inform course and program improvement efforts.

Our department has established an ongoing process for defining, assessing, and analyzing student

learning outcomes at both the course (CSLO) and program (PSLO) levels. CSLOs and Course Outlines of Record are aligned by focusing on curriculum requirements and targeted core competencies. We regularly assess CSLOs and student success data, discuss key findings during department meetings, and build upon these discussions to evaluate the effectiveness of our instructional and assessment practices. Course revisions follow the established process via the Curriculum Committee and CurricuNET. A department member serves on the SLOA Committee and reports back to ensure alignment with institutional standards and SLOA process improvement goals.

Assessment results are used to identify strengths, opportunities for improvement, and equity gaps. Faculty discuss grading practices, instructional methods, and curriculum design to refine course delivery and leverage outcome metrics. To ensure courses include equitable grading practices and comparable standards for academic rigor, SLO data are used to create consistent policies for assignment weighting, exam formats, and extra credit across multiple sections for the same course. Departmental professional development, including department-specific FLEX activities, provide additional opportunities to share strategies, develop equity-minded approaches, and modify SLOs to more accurately measure student mastery. These practices directly inform course revisions, instructional approaches, and broader program improvements to enhance student learning and success.

2. (OPTIONAL/NOT REQUIRED) Using the data provided by OIE, describe the most salient results of CSLO or PSLO mastery rates. Did you find significant differences by race, ethnicity, gender, and other categories?

N/A

Section 3: Other Areas of Program Effectiveness

1. Document any substantial changes to your program curriculum since the last review and discuss what prompted these changes. Looking forward, what changes to the curriculum do you plan based on the emerging needs of your discipline, industry, student population, etc.

In response to the available data and our ongoing program review activities, our department has continued to refine and update our curriculum to improve equitable access and pathway completion. We continue to evaluate the contents of our courses in light of recent developments in our field, we educate ourselves on the state of the art in biology, and we promote science and progress to our students.

In addition to ensuring course contents are updated, we also strive to make enrollment/attendance

easier. A hybrid BIOL 101 offering has been successful and expanded accessibility for students who work, have families, or lack transportation. Courses are offered on Fridays to provide more scheduling flexibility and help students enter the major in a timely manner. BIOL 190/190L has been offered off campus as a dual enrollment option and on campus during summer; these summer courses are open to all high school students regardless of home campus or service area in an effort to provide equitable access and to promote FC as a high-quality educational opportunity capable of preparing for transfer or the workforce while supporting professional, economic, and social mobility across communities.

In the near future we anticipate several interlinked curriculum and infrastructure developments. The new CTE/STEM building will generate more access to specialized instructional spaces, including dedicated biotechnology laboratories and a bespoke tissue culture facility with an anteroom or gowning room. We also plan to renew and expand laboratory infrastructure in the 400 building and replicate essential equipment, such as microscopes, in additional learning spaces like the STEM Center. This will allow our students to practice outside of class.

This updated infrastructure will allow us to continue offering updated curriculum that meets the needs of our industry and helps more students achieve their goals. In parallel our faculty maintain current backgrounds in their disciplines through professional activities including our own reviews of current research topics, collaborations with colleagues elsewhere, and seminars. Our curriculum promotes experiential learning, hands-on laboratory work, and real-world opportunities.

To sustain program capacity and maintain a feasible and coherent major pathway, recruitment of an organismal biologist is requested to prevent bottlenecks between the BIOL 170 prerequisite and BIOL 27x majors' courses series. Furthermore, the department will continue to expand dual enrollment partnerships in alignment with the Vision 2030 Initiative, strengthening equitable and early access to college-level coursework for high school students.

2. Please briefly describe opportunities your students have to apply and deepen knowledge and skills through projects, apprenticeship, internships, co-ops, clinical placements, group projects outside of class, service learning, study abroad, and other experiential learning activities that you intentionally embed in coursework or elsewhere in your program.

Our majors' courses are all taught by full-time faculty with experience in their respective disciplines in addition to their extensive pedagogical experience. We have devised laboratory exercises that address our curriculum in a hands-on manner that promotes active learning.

We leverage faculty expertise and connections to offer in-house research opportunities, collaborative research opportunities that allow our students to work on projects with faculty from other institutions, industrial internship opportunities, and where possible, job placements into academic or industrial laboratories. Former students routinely contribute toward our biotechnology

industry advisory board meetings in their current capacities as working professionals; others have been employed in various roles by FC and other academic institutions.

Faculty members have involved students in taxonomy projects, efforts to characterize the regulation of RNA transcription, experiments to help preserve biodiversity by inducing embryogenesis from somatic cells in rare species, and other research opportunities. We also maintain several relationships with industry partners and have entered a formal agreement with a large biotechnology firm, Amgen, to provide work experience and paid internships for FC students. One example of an embedded experiential learning activity is the ongoing collaboration between FC and CSUF that involves BIOL 193 students working with a CSUF biochemistry laboratory and generating research data while completing our curriculum.

3. Describe any laws, regulations, trends, policies, procedures, or other influences that have an impact on your program. These can include things like Vision 2030, CALGETC, Common Course Numbering, etc.

Vision 2030 and our commitment to the educational needs of the community have prompted the department to pursue high school and industry partners with whom to expand equitable access and workforce readiness. We are represented on the Dual Enrollment Committee, collaborate with the Dual Enrollment Director's office, and have created a high school-specific pathway beginning in the 11th grade and continuing through Fullerton College into university, professional school, or industry. We also pursue and maintain industry collaborations that prepare students for careers in biology.

The transition from IGETC to CalGETC affected all courses previously designated for general education transfer, and we are working with the Natural Sciences representative on the Curriculum Committee to ensure alignment with state requirements. Meanwhile, CCN is initially being implemented for BIOL 101 and is expected to extend to other BIOL 10x courses. The department is aligning course outlines and numbering to maintain articulation and achieve compliance.

Biotechnology courses are affected by federal, state, and county regulations governing the handling of cultured cell lines, the genetic transformation of organisms, the handling of biohazardous waste, the storage and handling of specialized materials, and the use of biological gases. These directives affect laboratory design, safety protocols, and instructional operations. Compliance requires specialized facilities, materials, and faculty preparation.

Section 4: Faculty and Staff

4.1 Population and Demographics

1. Using the data provided by OIE, describe your program's staff (full-time/part-time faculty, nonfaculty, classified). How reflective of your program's student population is your staff?

The total number of full time faculty has decreased since 2020, for reasons including retirements and the recent loss of a colleague. However, the majority of our CRNs are taught by full-time faculty, and this trend has increased in the last 5 years.

The total number of part-time faculty has also decreased due to restructuring of our schedule to better address demand and an effort to offer as many sections as possible taught by full-time faculty in order to maintain consistency throughout our courses. Not unusually, some former part-time faculty are now employed elsewhere.

Our faculty report as Asian, Hispanic/Latino, and White. Last year, 43% of our faculty were White, while 29% were Asian and 29% were Hispanic/Latino. The three largest student group ethnicities are therefore also represented in our faculty; however, the proportion of Latin/o/x/e students is larger than that of Hispanic/Latino faculty, whereas there are proportionately more Asian and White faculty than there are students respectively. The differences, though extant, are affected mathematically by the small size of our department which has decreased to only 8 full time faculty as of this writing. As of this writing, the majority (63%) of the faculty are female; similarly, the majority (58%) of our students are female.

-
2. Describe your program's staffing changes since fall 2021. How have these changes impacted your program's ability to achieve its strategic action plans?

The success of our action plans hinges on the existence of cognizant faculty to implement them. However, since 2021 we have lost 3 faculty members who taught BIOL courses and will lose a 4th faculty member by 2026. We therefore face staffing difficulties with both majors' and nonmajors' courses. Our need for additional full-time faculty has also been stated since the pre-pandemic era in Program Review and in previous Rationale for Full-Time Faculty Member Hiring documents; our department has been reduced by a total of 5 fewer full-time members since 2017 and we remain unable to offer courses in marine biology for lack of specialized faculty while anticipating the need to replace a retiring organismal biologist who teaches the gateway course for the major.

As a standing policy to uphold the rigor and consistency of our majors' courses and to ensure that students have full access to the faculty teaching those courses, all lectures and labs for the biology core (BIOL 170, 272, 274, 276) are taught by full-time faculty, as are most biotech courses (BIOL 191, 192, 193, 194, 196) and internship/research sections (BIOL 297). By doing so, our faculty have promoted equity while providing long-term guidance/mentorship. This policy means the number of adjunct sections is relatively low and fails to reflect the pressing necessity to add a full-time biologist. Moreover, skilled adjunct instructors are difficult to recruit and retain even for our

nonmajors' courses.

As mentioned, we have reviewed data on unique IP addresses visiting FC's online enrollment system with an interest in BIOL 170 to estimate how many additional students would pursue a biology degree if they were not faced with a waiting list. We conclude that we will be highly impacted if we are unable to staff a minimum of 6 or more BIOL 170 sections. We therefore continue to propose hiring a full-time faculty member specializing in organismal biology who can also teach GE curriculum to nonmajors.

The expansion of the biotech program both on and off campus (dual enrollment) has also strained the capacity of our technical support staff. We share one technician and one lab clerk with health sciences, but biotech is moving to a new CTE/STEM building while our other BIOL courses stay in Bldg 400, meaning we do not have enough staff to provide coverage either on or off campus. We therefore also need additional technical staff.

4.2 Staff Support and Professional Development

1. Describe the regular discussions your program faculty are having about equitable grading, attendance, late work, extra credit policies, and other strategies to support equitable student success.

Our department has FLEX Day activities to discuss equitable grading practices and evaluate the effectiveness of our approaches to equitable grading. Our next such activity is scheduled for January 2026. During these professional development activities we discuss the results of student assessments, the challenges or inequities that may generate different obstacles to success for our students, and methods to minimize the impact of those challenges or inequities. In addition to our experiences and findings, we also consider student feedback to identify potential concerns; recently, the department coordinator, a colleague from chemistry, and the Dean of Natural Sciences met with representatives from Associated Students to discuss equity-minded grading policies within our division. Our faculty senator is meeting with representatives from Associated Students soon for the same purpose. Our department also discusses equitable practices during regular department meetings.

These discussions are especially important in the case of multiple-section courses. In the interest of equity, it is important that we maintain not only academic rigor but also consistency in policies across multiple sections of the same course, and also as a department in general. For example, we have standardized policies on late work, maximum extra credit per semester, and absences; in our GE courses we also maintain generous exam/assessment drop policies that eliminate outlier low scores from student grades. We also allow project or lab report resubmissions to provide students opportunities for growth by incorporating feedback on key assessments.

2. How have these conversations shaped practices or policies in your program? What action has arisen from these discussions? If no action has been taken, why not?

As mentioned, our department participates in regularly scheduled FLEX activities on the development and implementation of equitable grading practices. We also discuss equity-minded practices in our department meetings. For example, to ensure consistency and equity across BIOL 101, a multi-section course taught by various instructors, we assigned a full-time faculty member to serve as course coordinator and we standardized the number of quizzes, exams, labs, and lab reports across all sections. We maintain communication among instructors and we have set policies regarding late work, extra credit, attendance (which is mandatory for laboratories), and in-class participation.

As a result, BIOL 101 policies now include dropping the lowest lab quiz and lab report scores plus the lowest lecture exam score. We have also adjusted the minimum passing mark threshold for the course to 65%, reflecting our commitment to more equitable grading standards without compromising academic rigor.

Other resources we use to support student success are embedded tutoring and the services offered by the STEM Center and/or the MESA Program. These resources provide targeted academic support to historically underrepresented and underserved student populations. Additional resources include our boot camps designed to help students with challenging topics that historically are barriers to successful course completion.

3. What additional areas of professional development could help your faculty and staff engage in this work?

One important area of professional development that would allow our faculty to better establish and maintain an equitable academic environment for our students is access to current developments and innovations within the life sciences. Our discipline evolves rapidly and it is crucial that our faculty remain current with emerging principles and methodologies so that we can devise appropriate pedagogical approaches to keep the curriculum itself competitive. Sabbatical opportunities for our faculty would address our need to maintain updated expertise levels in our field, and would allow us to continue delivering relevant curriculum to all students.

We would like to expand collaborations and partnerships with academic and industrial laboratories that can generate undergraduate research opportunities for our students. These collaborations would help bridge equity gaps between our students and their peers at universities due to the limited access to laboratory research that our college can offer compared to four-year universities. Such connections would provide our students with impactful hands-on learning experiences that will make them more competitive for transfer and/or employment. We would also like to expand

partnerships on campus, with the STEM Center, MESA Program, and Educational Partnerships and Programs to generate research opportunities for our students.

In addition, we may benefit from the feedback of other biologists who have implemented specific equity-minded grading policies in courses similar to ours. Robust datasets spanning as many sections and years as possible for specific topics such as molecular biology, cell biology, or biochemistry would be very informative, especially if they include assessment of long-term student academic and professional outcomes and data from courses with an in-person laboratory component.

Section 5: Program Planning

5.1 Progress on Previous Strategic Action Plans

1. Please discuss the goals (Strategic Action Plans, SAPs) from your last self-study. Assess and explain your progress on each of the SAP.

2021 SAP 1: Create a Campus STEM Resource Center

This goal has been realized with the creation of the STEM Center on campus. The Center provides resources including tutoring opportunities, interactions with STEM faculty, events for professional development and career exploration, and areas where students can study. We strongly support the STEM Center and MESA Program, and are now requesting that the funding for necessary personnel be included in our campus budget.

2021 SAP 2: New Full-Time Dual Enrollment Instructor

This position has not been funded. As a result, we are relying on adjunct colleagues to meet many of our dual enrollment demands both off- and on-campus. The long-term success of this goal will depend on the available funding to support a full-time faculty member. As mentioned, we have lost additional faculty members since our last Self-Study and anticipate additional reduction in our ranks.

2021 SAP 3: New Full-Time Biology Instructor (Organismal Biology)

This position has not been funded. As a result, we anticipate being severely impacted if we are unable to offer ~6+ sections of BIOL 170, the gateway course to the major, every semester. Faculty retirements are generating difficulties in staffing key courses to meet student needs, as noted in our 2017 and 2021 program review. We continue to propose hiring an organismal biologist to address the persisting student demand for our organismal biology course that is a requirement for biology majors. Ideally, the new faculty member would also be able to teach marine biology courses that we

are currently unable to offer for lack of a specialized instructor.

2021 SAP 4: Collaboration with Administration of Justice Department to offer the BIOL 190L class for a cohort of Crime Scene Investigator students

This SAP has resulted in the establishment of a state-recognized certificate program in collaboration with Administration of Justice, and enrollment is strong. Due to the success of this SAP and keen student interest, we are now moving toward creating skills builder certificates for dual enrollment students.

2021 SAP 5: Offer Biotechnology Courses as Short-term classes

This SAP was intended to alleviate bottlenecks toward certification. To meet the needs of students to whom this SAP was directed, we have now leveraged guided pathways that allow students to move from high school to FC and beyond in a time-effective manner. We also leverage summer sessions that are shorter than regular semesters and offer appropriate BIOL 190 and BIOL 190L courses during that time. Regarding tissue culture training for post-baccalaureate and working professional students, our current capacity is maximized due to the small size of the tissue culture room. The new STEM/CTE building should resolve that constraint.

2021 SAP 6: Update High Use Biology Prep Room/Lab Room Equipment

We have replaced key equipment, including a deli as requested, and are currently represented in the Building User Group for the new STEM/CTE building that will house our biotechnology courses and require equivalent equipment. We are collaborating with Health to obtain funding for a service contract for the existing autoclave. We continue to take a proactive approach to equipment procurement and maintenance.

2021 SAP 7: Update Classroom Technology for Student Assessment and Collaboration

We obtained funding and are providing students with sets of laptop and tablet computers for use in class, and we are also equipped with storage for this equipment. We remain committed to fully utilizing appropriate technology for enhanced engagement, critical thinking, and class communication and our continuing goal is to have updated technology (laptops/tablets/software) for our classes.

2021 SAP 8: Replace Models and Expand Specimen Collections and Manipulatives for Biology Courses

We have updated models and manipulatives for BIOL 101, 102L, 170, and 274. These courses require updated materials to offer students an appropriate educational experience, and we continue to replace/update our resources as they wear out and/or approach obsolescence.

2021 SAP 9: Funding for Research Projects

We are still pursuing this SAP and request funding. Research projects are implemented via BIOL 297, a research/internship course. Hands-on experience is crucial to engage and prepare students while bridging equity gaps, yet many of our students may be less likely to participate in unpaid internship opportunities since they need to have paid employment. We are pursuing cooperating employment sites for BIOL 297 interns and collaborating with academic researchers and industry. For example, an agreement between FC Biology and Amgen is offering our student interns an hourly wage; these students now have the opportunity to earn money for themselves and/or their families while gaining valuable experience in the field. However, our agreement only provides for 2 students. We are requesting sustained funding for 10 students to conduct paid academic research or internships.

2. If additional funds were NOT allocated to you in the last review cycle, how did the LACK of funds have an impact on your program?

The greatest impact to our program is our inability to replace faculty members. Decreasing personnel and increasing demand have made it difficult for us to offer adequate sections and we remain completely unable to offer specific courses for many years. We now face difficulties with our majors' gateway course (BIOL 170) and GE options.

Since 2017, we have lost 5 faculty members who taught BIOL courses and will lose a 6th faculty member in 2026, resulting in staffing difficulties with majors' and nonmajors' courses. Detailed analyses of job market, career data, transfer rates, and degree/certificate completion appear in our annual Program Review documents and support area growth projections. Our need for additional full-time faculty has also been stated since the pre-pandemic era in Program Review and in previous Rationale for Full-Time Faculty Member Hiring documents.

Analyses of our enrollment, waitlist, and enrollment website access data indicate we will be highly impacted if we are unable to staff a minimum of 6 or more BIOL 170 sections. An organismal biologist is necessary, with a working knowledge of taxonomy, field and laboratory skills, natural history, physiology, comparative anatomy, ecology, and modern molecular principles. The instructor workload and demands of our other courses make assigning additional sections to our remaining faculty impossible. BIOL 170 is a prerequisite for all courses in the BIOL 200-series sequence. As reported, we have lost 2 faculty specializing in BIOL 170 and will lose a 3rd in 2026. This has made it difficult to offer adequate sections of BIOL 170, which in turn will affect all majors' courses, and thus degree completion, retention, and transfer rates. Moreover, biology majors take CHEM, PHYS, MATH, and GE courses. Students who are unable to enter the major or face delays may enroll elsewhere and never return to FC, meaning our entire division may be affected in terms of enrollment, success and retention rates.

We also continue to face a significant problem recruiting and retaining trained adjunct faculty who

can help us meet GE needs and free our full-time faculty to focus more on the impacted majors' and certificate courses. We are actively pursuing methods to increase awareness of the teaching opportunities in our department among potential adjunct colleagues; for example, a recent meeting between Natural Sciences coordinators and the Dean of Ethnic Studies has provided us with several innovative ideas to help our recruitment efforts. Regarding training recruited adjunct colleagues, we can leverage the scientific and pedagogical experience of our full-time faculty and set up time-efficient training sessions to share our most effective and equitable methods, approaches, and techniques. We are therefore requesting operational funding to recruit and train adjunct faculty.

For many years we have requested that funds be invested and personnel be assigned to a critical task that will benefit the entire campus: a campus-wide system to automatically track and award student achievement of degrees and/or certificates. Our data indicate that a significant number of students earn a degree or certificate, yet due to the absence of an automated system that tracks student milestone achievement, it is very difficult to track and record them. Assessing program metrics is laborious and prone to errors, and FC students are inadvertently deprived of degrees/certificates for which they may qualify without their knowledge. Under the chancellor's and governor's implemented funding model, FC funding hinges on the number of degrees and certificates we issue. We feel the College risks underreporting and departments campus-wide may not be acknowledged for the achievements of their students without an automated system to identify program completion.

Neighbouring institutions have successfully implemented such programs. **Since our last Program Review Update, we have participated in a limited pilot study that was successfully executed by FC Admissions and Records. This pilot program showed it is feasible and effective to record degrees and certificates at FC. Regrettably, it too is now unfunded. This issue affects not only our BIOL degree and certificates, but potentially every department on campus.**

Previous requests for operational support of biotechnology courses were not funded. We have had to rely on alternative sources of funding for paid internships and running expenses for our biotechnology program. Without that funding we would not have been able to run biotechnology classes that have generated 45 certificates in 2024-2025 and have served community members from high school dual enrollment students to colleagues working in academia or industry who turned to our curriculum to expand their skill sets.

SAPs

Increase Opportunities for Funded Research Projects

Short Description:

Hands-on research projects are essential training for biologists. We envision multiple opportunities encompassing various research foci both on- and off-campus to equitably accommodate the broad interests of our students and foster collaboration between students with varying interests and skill sets while providing experience in novel scientific research locally. However, many of our students face academic and socioeconomic equity gaps. Promising students may be less likely to participate in unpaid internship opportunities if they need to have paid employment. Providing interns an hourly wage helps promote equity in the group of students participating in our projects. Students would now have the opportunity to earn money for themselves and/or their families while gaining valuable experience in their field of study. This experience would make our students more marketable for future employment in the biosciences industry and university research settings, and help close equity and experience gaps between them and their peers at universities that have more research opportunities.

Measurable Outcomes:

This SAP will set FC apart from other institutions, and improve student success and retention while encouraging course and degree completion here. We anticipate increased enrollment in our internship course and increased success in the program and transfer rates.

College Goals:

1.2. Increase equitable usage of apprenticeship/internship

SAP Phase:

New

Resource Requests**Increase Opportunities for Funded Research Projects: Up to 10 Funded Interns Per Year****Enhancement:**

Our program will attract more students to paid rather than unpaid internships and research opportunities. Research is a critical part of a biologist's training, and our paid internships will promote success for students from underrepresented backgrounds. Internships will also expand our workforce training partnerships and align curriculum with industry needs to enhance job readiness. Students will learn to integrate critical thinking and hands-on skillsets, making them more likely to succeed in a rigorous and competitive environment and increasing course, certificate, and degree completion and transfer rates. This SAP helps reduce equity barriers by enabling all students to engage in research because it ensures sufficient financial resources for students dedicating their time to lab or field work. The significance of internships to student progress has led us to pursue an agreement between FC Biology and Amgen which offers our student interns an hourly wage to help support themselves while gaining crucial experience in the field. However, our agreement only provides for 2 students and cannot serve as a substitute for FC

institutional support. We are therefore requesting sustained funding for 10 students to conduct paid academic research or internships. Over 4 years our costs are 10 Student hourlies \$20/hr X 10hr/week X 16 weeks = \$32,000 annually X 4 years = \$128,000

Personnel-Related:

No. This request involves funding for students to complete research internships and projects.

Resource Category:

Non-Faculty Personnel

Quantity:

4

Unit Cost:

\$32,000.00

TotalCost:

\$128,000.00

Full-Time Biology Instructor

Short Description:

We request an additional full-time biology instructor specializing in organismal biology to meet our immediate needs. Increasing enrollment and drastically decreasing personnel have made it difficult for us to meet demand for our courses; we remain unable to offer specific courses for many years and are now facing difficulties with our majors' gateway course and GE options.

MeasurableOutcomes:

The instructor will allow us to continue serving students by providing a minimum of ~6 sections of BIOL 170 per semester (enrollment capacity is 144 students per semester; waiting lists are routine). This is the gateway course to the major. As discussed, our entire majors' program will be severely impacted by any reduction in enrollment in BIOL 170; the potential 33% drop in enrollment would drastically reduce program completion rates (degrees/certificates), and would decrease enrollment in MATH, PHYS, and CHEM by driving students to enroll at competing institutions. Any inability to meet student needs for major or GE courses would directly reduce college funding. We awarded 33 degrees and 45 certificates in 2024-2025. We anticipate steady enrollment and completion rates commensurate with current trends rather than a sharp decline if we cannot offer enough majors' courses. Our courses recorded a unique headcount of 1,603 students in 2024-2025; if we add a full-time faculty member we also anticipate continuing to serve GE students despite strong demand for GE BIOL courses.

College Goals:

3.2 Reduce equity gaps in degree/certificate completion

SAP Phase:

New

Resource Requests**Full-Time Biology Instructor****Enhancement:**

Organismal biology is the first majors' course and is required for all courses in the BIOL 27x sequence. As reported in annual Program Reviews, we have lost 2 faculty specializing in BIOL 170 and will lose a 3rd in 2026. This has made it difficult to offer adequate sections of BIOL 170, the gateway course to the biology major. Inability to offer adequate BIOL 170 sections will affect all majors' courses, and thus degree completion, retention, and transfer rates. Since biology majors take CHEM, PHYS, MATH, and GE courses, any students who are unable to enter the major or face delays may enroll elsewhere and take all those courses elsewhere too, meaning our entire division may be affected. We therefore propose hiring a faculty member specializing in organismal biology who can also teach GE curriculum to nonmajors. Cost will be according to NOCCCD scale; estimate per year is shown below.

Personnel-Related:

We have lost 5 faculty members who taught BIOL courses in the last 8 years and will lose a 6th faculty member by 2026. As a result we are also facing staffing difficulties with nonmajors' courses. Detailed analyses of job market, career data, transfer rates, and degree/certificate completion appear in our annual Program Review documents and support area growth projections. We have requested an additional full-time faculty member since the pre-pandemic era in Program Review and in previous Rationale for Full-Time Faculty Member Hiring documents. BIOL 170 requires an organismal biologist. Organismal biology is a specialized discipline requiring a rare combination of proficiencies that makes replacing a full-time instructor for our critical gateway course a challenging top priority. The workload and demands of our other courses simultaneously make assigning additional sections to our remaining faculty impossible. We are finding it increasingly difficult to find adjunct faculty to staff our general education classes, including BIOL 101, BIOL 102, and BIOL 190/190L (biotechnology). Several of our well-qualified adjuncts have found employment elsewhere and it is rare to find qualified replacements. Our Biotechnology Certificate Program is growing and occupies two full-time faculty. Their ability to teach our other courses is therefore limited. This program also offers dual-enrollment sections at various high schools, which further limits the availability of any adjunct colleagues. Meanwhile, overall class sizes at census in Fall 2024 (average: 24.3 students) reveal full sections and we expect continued future demand whereas the number of full-time faculty continues to drop. Economic impact assessments of the life sciences are positive regarding sustainability potential and the career outcomes of life science professionals in our state. Southern California is a life sciences hot spot and our field has a major impact on the state's economy (<https://www2.biocom.org/l/54352/2025-06-18/n6h2pc>). The life sciences are competitive and

our field is expected to continue growing. To ensure consistency, impactful faculty-student engagement, and academic rigor, all biology core courses (BIOL 170, 272, 274, 276), most biotechnology courses (BIOL 191, 192, 193, 194, 196), and internship/research sections (BIOL 297) are taught exclusively by experienced full-time faculty. This policy promotes equity and sustained mentorship but limits the number of adjunct-taught sections, underscoring the urgent need for an additional full-time biologist. Despite our conscious emphasis on utilizing full-time faculty in the program, in Fall 2024 30% of our sections were taught by adjuncts. Meanwhile, recruiting and retaining qualified adjunct instructors has become increasingly challenging even for nonmajors' courses. These factors mean that the number of adjunct sections does not adequately reflect the severity of the need for a new full-time faculty member.

Resource Category:

Full-time Faculty

Quantity:

1

Unit Cost:

\$85,755.00

Total Cost:

\$85,755.00

Create Lower-Unit Skill Builder Biotechnology Certificates (Shared with Administration of Justice)

Short Description:

Hands-on skills allow our students to be competitive for employment in the Biotech/Life Sciences industry. In addition, these skills can allow students to be more competitive for lab positions upon transferring to 4-year institutions. As we continue to recruit students into the biotech pathway via our dual enrollment offerings, lower-unit certificates will allow students to gain meaningful experience while earning “skill builder” certificates. These lower-unit certificates can serve as milestones of achievement that will motivate students to continue on the path to a larger-unit certificate or degree. These certificates will be more accessible and attainable to high school students as they engage in our dual enrollment pathways. We propose making an 8-unit “Biotech Skills” certificate and an 8-unit “Forensic Science Skills” certificate. With both Administration of Justice and Biotech offering dual enrollment classes, this will allow high school students to work toward a certificate that is achievable by the end of their high school journey.

Measurable Outcomes:

The creation of lower unit certificates could increase the number of dual enrollment students in

biotech and AJ classes, increase the number of certificates earned by high school and college students, boost job skills and thus increase employment. Skill builder certificates may help decrease time to completion of certificates/degrees, as students will enter the path early and have smaller milestones along the way.

College Goals:

1.1 Equitable Dual Enrollment access

SAP Phase:

In Progress

Resource Requests

Create lower unit Skill Builder Biotech Certificates (Shared with Administration of Justice)

Enhancement:

Lower unit skill building certificates can increase enrollment in biotech, provide certificates that can be completed by students in high school, boost job skills, and increase employment. Supplies: Marketing materials to promote the new certificate options \$100 x 3 years: Color flyers printed through NOCCCD Printing

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

3

Unit Cost:

\$100.00

TotalCost:

\$300.00

Technician for Evening/Weekend Classes (Shared with Health Sciences)

Short Description:

We request a part-time technician to provide support for our classes that operate in the evenings or on weekends. Our existing technicians work very hard and are very effective at supporting our courses when they are present, but they cannot realistically be present during all courses we offer.

We need additional assistance to address an equity gap and course support problem as a result.

Measurable Outcomes:

Demand for classes, limited space and our goal to maximize accessibility of the curriculum have led us to offer courses late in the evening and during non-traditional hours. This means our existing technicians cannot always provide technical coverage. This request is intended to eliminate the equity gap and ensure all courses have the same technician support regardless of when they are scheduled.

College Goals:

1.3 Night, weekend, online degree program

SAP Phase:

In Progress

Resource Requests

Technician for Evening/Weekend Classes (Shared with Health Sciences)

Enhancement:

Our program is limited in the number of labs we can run concurrently by instructor and room availability. All labs should receive the same technical support to allow our program to continue offering high-quality, equitable educational opportunities. The existing situation leaves several sections of courses without appropriate support and generates an equity gap as a result. We want all our students to be provided the best opportunities to succeed in our curriculum.

Personnel-Related:

Courses that are offered early in the morning, late at night, and/or on Fridays and require logistical and technical support from our technicians include BIOL 101, BIOL 170, BIOL 190L, BIOL 191, and BIOL 192. We request the addition of a laboratory technician, initially on a part-time basis, to cover those hours not attended by our existing personnel. This technician, like our existing support personnel, will be shared with Health Sciences.

Resource Category:

Non-Faculty Personnel

Quantity:

1

Unit Cost:

\$65,892.00

Total Cost:

\$65,892.00

Update Marketing and Recruitment Material for the Biology Department

Short Description:

Recruitment of students to Fullerton College is critical to increasing enrollment and helping students find their desired pathway. Marketing materials for the Biology department including our website, brochures, and flyers will all need updating with the transition to Cal-GETC. Our diverse community and student body require various types of marketing and informational materials. In addition, we would like to translate our brochure into various languages that reflect our local community.

Measurable Outcomes:

We hope to increase access to updated course numbers and pathways available in the biology department. By translating our flyers we may reach more people in their primary language. We can collect information about how many people visit our website and ensure students are interacting with an updated interface. Without funding to update our website and printed marketing material, we will reduce our ability to reach prospective students and provide them clear and correct information. Seeing differing information on a website compared to the FC catalog will cause confusion and distress for students and possibly hinder their ability to move through their pathway in an efficient manner. In addition, not having these marketing materials could result in a loss of enrollment across current and prospective students.

College Goals:

1.5 Outreach strategies for prospective students/family

SAP Phase:

New

Resource Requests

Supplies to Update Marketing and Recruitment Material for the Biology Department

Enhancement:

Updated and consistent marketing materials will be critical for students as we transition to Cal-GETC. This transition is confusing for students as the course numbers they started with will now be changing for many of our courses. It will be critical that we update our website, brochure, and flyers to reflect all new course numbers to match the course catalog. This will ensure that students are not confused by differing information because materials are out of date. Updating marketing materials will also be needed to recruit new students to our programs. Having updated brochures ensures that we can continue to provide these resources in many locations on campus including the counseling center, Natural Sciences lobby, Natural Sciences classrooms, the library, Student

Resource Center, and many more. Having printed flyers and brochures is critical for speaking with students at on campus events including various Promise Jump Start events, Major Exploration Day, and others that our faculty take part in. Over the last year we have been providing enrolled biotech students an entrance survey to gain insight into how they learned about our program and decided to enroll in a class. 24% of students were encouraged by a FC professor, 23% of students were referred by a counselor, 15% of students found our website, 14% of students saw a flyer on campus, 13% of students engaged with us at a high school event, and 12% engaged with us at a FC event. These data highlight the importance of multiple modes of marketing and engagement of students. Having these materials will allow our department to continue to reach students and increase enrollment in our classes and programs. Supplies: 500 brochures per year (\$300/year), color copies for fliers and A-Stand posters (\$300/year)=\$600 per year Costs below are for 4 years.

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

4

Unit Cost:

\$600.00

TotalCost:

\$2,400.00

Professional Expert for Updating Marketing and Recruitment Material for the Biology Department

Enhancement:

Updated and consistent marketing materials will be critical for students as we transition to Cal-GETC. This transition is confusing for students as the course numbers they started with will now be changing for many of our courses. It will be critical that we update our website, brochure, and flyers to reflect all new course numbers to match the course catalog. This will ensure that students are not confused by differing information because materials are out of date. Updating marketing materials will also be needed to recruit new students to our programs. Having updated brochures ensures that we can continue to provide these resources in many locations on campus including the counseling center, Natural Sciences lobby, Natural Sciences classrooms, the library, Student Resource Center, and many more. Having printed flyers and brochures is critical for speaking with students at on campus events including various Promise Jump Start events, Major Exploration Day, and others that our faculty take part in. Over the last year we have been providing enrolled biotech students an entrance survey to gain insight into how they learned about our program and decided to enroll in a class. 24% of students were encouraged by a FC professor, 23% of students

were referred by a counselor, 15% of students found our website, 14% of students saw a flyer on campus, 13% of students engaged with us at a high school event, and 12% engaged with us at a FC event. These data highlight the importance of multiple modes of marketing and engagement of students. Having these materials will allow our department to continue to reach students and increase enrollment in our classes and programs. PE contract for hours for flier and brochure updating/design and website updating and maintenance. 35hrs a year x \$55 PE rate=\$1925/year, plus 8% for benefits=\$154/year=\$2079 Costs below are for 4 years.

Personnel-Related:

This request involves a PE contract for a non-faculty expert to generate and update marketing and recruitment material that will serve our outreach needs. Our goal is to increase enrollment, retention, and completion.

Resource Category:

Non-Faculty Personnel

Quantity:

4

Unit Cost:

\$2,079.00

TotalCost:

\$8,316.00

Forensic Science Summer Camps

Short Description:

We request funding to continue offering free, 1 week Forensic Science themed summer camps for high school and college students. These summer camps offer students the opportunity to explore career opportunities and gain hands on, high impact skills over a 1 week summer experience. These camps are offered for free by biotech faculty and short term hourly employees. Students visit the new FC Crime Room where they experience a mock crime scene. Students are then tasked with analyzing evidence from the crime room using biological techniques. Students share their findings with their peers via group presentations. The experience allows students to explore Forensic Science in a free, low stakes, fun environment before enrolling in a dual enrollment or FC based biotech course. Each summer 25 high school students and 25 college students are accepted to the summer camp.

MeasurableOutcomes:

Providing free science camps for high school students allows for equitable participation and outreach for our community. Science camps are costly and often unattainable financially for many

students. Our camp serves students from our feeder high schools and provides them an opportunity to visit our campus and learn more about our programs and services. High school participation in summer camp could increase participation in our dual enrollment offerings and increase the likelihood these students will attend FC after graduation. College students are often still struggling to decide on a major. Participation of our own FC students in summer camps has increased enrollment in our classes over the last few years. The summer camp allows students to experience the Forensic Science field and can help them decide on an area of study.

College Goals:

1.5 Outreach strategies for prospective students/family

SAP Phase:

New

Resource Requests

Professional Expert for Forensic Science Camps

Enhancement:

Participation in our free summer camps can increase the number of high school students exposed to hands-on science early in their educational journey. This exposure could prompt students to enroll in our available dual enrollment courses. In addition, college students that experience high impact, hand-on scientific techniques are much more likely to enroll in our biotech classes. This will provide career/major exploration allowing students to be more confident when enrolling in a degree/certificate pathway. Students that participate in summer camps feel more confident in the classroom and their prior experience could contribute to their overall belonging and success in our courses. 1 Faculty member (PE contract): 4 days X 8hrs=32hrs, plus 10 hours of prep • 42hrs x \$55: \$2,310 + benefits (\$185)=\$2500 per summer; duration is 4 years until our next comprehensive Program Review.

Personnel-Related:

This request involves PE compensation for a faculty member to serve the Forensic Science Camps. The camps will provide career/major exploration and make students more confident when enrolling in a degree/certificate pathway. Students that participate in summer camps are more confident and this activity is intended to increase student enrollment, success, and retention rates.

Resource Category:

Non-Faculty Personnel

Quantity:

4

Unit Cost:

\$2,500.00

TotalCost:

\$10,000.00

Supplies for Forensic Science Summer Camps**Enhancement:**

Participation in our free summer camps can increase the number of high school students exposed to hands- on science early in their educational journey. This exposure could prompt students to enroll in our available dual enrollment courses. In addition, college students that experience high impact, hand-on scientific techniques are much more likely to enroll in our biotech classes. This will provide career/major exploration allowing students to be more confident when enrolling in a degree/certificate pathway. Students that participate in summer camps feel more confident in the classroom and their prior experience could contribute to their overall belonging and success in our courses. \$1,300 per summer; duration is 4 years until our next comprehensive Program Review. Supplies include: Name tags (\$25/per 50), folders (\$25/box of 50), summer camp manual (\$50/50), t-shirt (\$10) x 60, magnetic powder refills (\$15/bottle), Biorad digest kits (\$200 x 2) + shipping (10%)=\$1300

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

4

Unit Cost:

\$1,300.00

TotalCost:

~~\$5,200.00~~

Hourly Employees for Forensic Science Summer Camps**Enhancement:**

Participation in our free summer camps can increase the number of high school students exposed to hands- on science early in their educational journey. This exposure could prompt students to enroll in our available dual enrollment courses. In addition, college students that experience high impact, hand-on scientific techniques are much more likely to enroll in our biotech classes. This will provide career/major exploration allowing students to be more confident when enrolling in a degree/certificate pathway. Students that participate in summer camps feel more confident in the classroom and their prior experience could contribute to their overall belonging and success in our courses. Hourly employees for the forensic summer camps include: Non-Faculty Personnel: 8hr x

4 days= (32hrs) + training and setup/prep (16hrs) = 48 hours 6 Hourly employees (\$20/hour x 48 hours)=\$5760 + Benefits (~\$500)=\$6260 per summer; duration is 4 years until our next comprehensive Program Review.

Personnel-Related:

This request involves PE compensation for a non-faculty personnel to serve the Forensice Science Camps. The camps will provide career/major exploration and make students more confident when enrolling in a degree/certificate pathway. Students that participate in summer camps are more confident and this activity is intended to increase student enrollment, success, and retention rates.

Resource Category:

Non-Faculty Personnel

Quantity:

4

Unit Cost:

\$6,260.00

TotalCost:

\$25,040.00

Resource Requests

Institutional Support for MESA Program and STEM Center Personnel (Shared Request)

Enhancement:

The MESA Program supports students from historically underrepresented and economically disadvantaged backgrounds in STEM fields. The STEM Center itself increases access by providing mentorship, resources such as academic and professional support, and assistance for students that need help with coursework or career preparation. We anticipate enhanced opportunities such as research experiences, access to professional networks, seminars, and other events to reduce barriers and improve retention and degree completion for biology students who might otherwise have limited resources. Costs for Director and Administrative Assistant III combined: Director, Academic Support Programs (MESA): (\$165,460 salary) + (\$3,500 doctoral stipend) + (\$2,646.10 fringe benefits) + (\$61,091.77 benefits) = \$232,697.87 Administrative Assistant II: (\$6,617 x 12 months) + (\$2,646.10 fringe benefits) + (\$29,209.84 benefits) = \$111,259.94 Total = \$ 343,956 annually; Unit Cost below is the annual cost. We request sustained institutional funding.

Personnel-Related:

The California Community Colleges Board of Governors has formally codified the MESA Program

in Title 5. College districts have until April 26, 2026, to align local policies with these regulations and must ensure programs are adequately staffed and supported. Although MESA funding will no longer be competitive, the \$280,000 annual allocation is insufficient to cover both student activities and staff salaries after July 1, 2027. MESA's mission to develop diverse STEM talent, expand transfer pathways, and close equity gaps is aligned with Vision 2030 and the STEM center is a tremendous asset to our students and to the campus. We therefore request support for the Director and Administrative Assistant II.

Resource Category:

Non-Faculty Personnel

Quantity:

1

Unit Cost:

\$343,956.00

Total Cost:

\$343,956.00

Certificate and Degree Tracking/Evaluation Personnel and Resources (Shared Request, Campus-Wide)

Enhancement:

We request that the District provide certificate/degree tracking personnel and software as needed to benefit all divisions. Currently all divisions have different certificate application procedures. This generates a confusing and difficult landscape for students trying to apply for a certificate on our campus. However, degree applications are submitted to Admission and Records and evaluated and granted via that office. A streamlined application process for both degrees and certificates is crucial for providing clear and equitable access for students to apply and earn these educational milestones. To address this issue, we participated in a 1 year pilot study with Admissions and Records that established the feasibility and time needed to evaluate and award certificate applications. The pilot study allowed A&R to evaluate 4 biotech certificates over a 1 year period thus leading to a clear proposal for transitioning all certificates to A&R over a multiyear transition. A&R noted the need for 2 additional full time evaluators to be able to handle the increased work load. The pilot study was well received by students, and resulted in the largest number of biotech certificates awarded over the last 5 years. This issue affects not only our BIOL degrees and certificates, but potentially every department on campus. We therefore request funding as needed for the personnel and equipment to evaluate and record all FC certificates via Admissions and Records. There is currently no automated system to track student progress toward a certificate/degree and the new statewide college funding system is based on completion metrics that our campus cannot assess in an automated manner. The enrollment figures for our courses leading to CTE certificates are indicative of an important challenge we face in documenting our

successful response to state funding requirements that are tied to certification, degree completion, and transfer rates. In short, a significant number of students earn certificates and/or AA/AS/AS-T degrees, yet the absence of an automated system and personnel dedicated to tracking and evaluating student progress and recording/issuing certificates/degrees to students who achieve these milestones makes it very difficult to track and record them. Assessing program metrics remains laborious and error-prone while depriving FC of student achievement data and depriving students who may not be aware of their qualifications of degrees and/or certificates. Under the state chancellor's and governor's funding model, colleges are incentivized based on the number of students who complete degrees, earn certifications, or successfully transfer to four-year institutions. However, without an automated mechanism in place to identify and document these achievements in real time, the college risks underreporting its positive outcomes. Underreporting is particularly problematic as it may lead to reduced funding and a misrepresentation of FC's success. 2 evaluators needed. $\$5,500 - \$6,500/\text{month} + \text{benefits (8\%)} = \$78,000 + \$6,240 = \$84,240/\text{evaluator}$ Total = $\$168,480$ annually.

Personnel-Related:

The pilot study has indicated that A&R could complete the tasks with the addition of 2 full-time evaluators.

Resource Category:

Non-Faculty Personnel

Quantity:

2

Unit Cost:

\$84,240.00

Total Cost:

\$168,480.00

Funding for Biology Boot Camps

Enhancement:

We request a small ongoing budget to provide funding for boot camps offered each semester by biology faculty. Each boot camp provides targeted, hands-on practice of key concepts and skills for critical biology courses, including Biology 170 (the entry to the biology major) and Biology 101 (the biology course serving the highest number of students). Boot camps address common difficulties in these courses and support students in developing effective study strategies, which sets students up with a foundation for success in the biology pathway. Boot camps attract a high number of students each semester (Fall 2025: 55 registrations; Spring 2025: 97 registrations; Fall 2024: 100 registrations). Students consistently rate their experience of the boot camps positively, as measured in evaluation surveys. Some boot camps provide Canvas shells with additional resources and references that students can make use of throughout their biology courses, and students do

return to the Canvas shell even after the boot camp is concluded. Offering boot camps is an important strategy for supporting student success, equity, and the development of students as effective learners. Participating in boot camps strengthens student performance and improves student skill sets, thereby helping prepare them to enter into transfer institutions and workforce positions in biology. Boot camps are offered at no cost to students, ensuring access to support for all biology students. Additionally, a biology faculty member serves as the coordinator for all boot camps offered through the Natural Sciences division. This includes boot camps in physics and chemistry as well as biology. This position requires communication and organization with a variety of faculty teaching boot camps as well as counselors, advertising, data collection, and administrative tasks. We request a small amount of funding to support the work done to coordinate student success boot camps throughout the sciences. Boot camps were previously supported by the Project RAISE grant through CSUF. However, this funding source is no longer available, and we need reliable institutionalized support to continue offering boot camps in the future. Costs are 25 work hours for boot camp instruction plus 25 work hours for boot camp coordinator, at professional expert pay rate for faculty (per semester; 8 semesters are requested to cover funding until our next comprehensive Program Review).

Personnel-Related:

A small budget is requested to support Boot Camps in order to better prepare our students for the curriculum and improve student performance so as to increase retention, completion and transfer.

Resource Category:

Non-Faculty Personnel

Quantity:

8

Unit Cost:

\$2,420.00

TotalCost:

\$19,360.00

Microscope Slide Folders for Biology 170

Enhancement:

The laboratory for BIOL 170, which is the critical entry course to the biology major, includes extensive work with microscope slides. Currently, our slide storage systems do not sufficiently protect our microscope slides from dust and dirt while not in use. As a result, microscope slides are constantly dusty and accumulate stains and fading. This issue impedes student learning, because students regularly struggle to distinguish specimens from dust and dirt on the slides. Cleaning the slides each semester is labor-intensive and ineffective. We request new slide storage folders to keep our microscope slides clean so that students can work with them more

productively, improving student learning.

Personnel-Related:

No.

Resource Category:

Equipment

Quantity:

45

Unit Cost:

\$16.00

TotalCost:

\$720.00

Service Contract for the Autoclave (Shared with Health Sciences)

Enhancement:

These are services for maintaining essential equipment for the Biology/Biotechnology program and Health Sciences/Microbiology. The 400-building autoclave is also used by Health Services occasionally and is necessary for sterilizing tools, reagents, and wastes for these programs. Cost is \$10,500 annually or \$42,000 for a 4-year contract until our next comprehensive Program Review.

Personnel-Related:

No.

Resource Category:

Other

Quantity:

4

Unit Cost:

\$10,500.00

TotalCost:

\$42,000.00

Animal/Specimen Waste Disposal (Shared Cost with Health Sciences Department)

Enhancement:

Disposal of animal/specimen waste from ANAT 231, BIOL 170, and BIOL 102L dissections. Dissections are an essential component in these labs, and waste disposal must follow state and federal safety guidelines. \$3,500/year = \$14,000 total for 4 years

Personnel-Related:

No.

Resource Category:

Other

Quantity:

4

Unit Cost:

\$3,500.00

TotalCost:

\$14,000.00

Microscope Maintenance and Cleaning (Shared with Health Sciences)**Enhancement:**

Microscopes are a critical component in many lab courses, including: MICR 262, BIOL 272, ANAT 231, BIOL 170, and BIOL 101. Maintenance of specialized equipment reduces the need for more costly replacements. \$2,500/year = \$10,000 for 4 year cycle

Personnel-Related:

No.

Resource Category:

Other

Quantity:

4

Unit Cost:

\$2,500.00

TotalCost:

\$10,000.00

Maintenance and Validation of Micropipettes**Enhancement:**

Micropipettes are equipment needed for BIOL 272 in our majors courses and in all laboratory courses for our Biotechnology program (BIOL 190L, 191, 192, 193, 196). This equipment requires professional servicing and testing to ensure accuracy, safety and functionality. Costs are \$2,250/year = \$9,000 for 4-year cycle.

Personnel-Related:

No.

Resource Category:

Other

Quantity:

4

Unit Cost:

\$2,250.00

TotalCost:

\$9,000.00

Veterinary Care for Animals

Enhancement:

In biology departments the keeping of animals is a common and necessary practice for a variety of pedagogical purposes. To ensure their well-being and compliance with ethical standards, it is important and necessary to provide both routine and emergency veterinary care. This may include regular health assessments, preventive treatments, and immediate attention to any injuries or illnesses. Securing adequate funds for veterinary services is needed in order to maintain the health of the animals. This is a recurring need involving animal welfare. Necessary veterinary expenses cannot be postponed without endangering the animals. This resource allocation will allow our program to continue maintaining animals as is common and necessary for our discipline. Our biology courses teach students about the diversity and complexity of life, and the animals we maintain are an integral part of our curriculum. \$2,500 annually, recurring; \$10,000 for 4 years.

Personnel-Related:

No.

Resource Category:

Other

Quantity:

4

Unit Cost:

\$2,500.00

TotalCost:

\$10,000.00

Safety Training for Adjuncts

Enhancement:

Our College is required to maintain a safe learning environment in all laboratory sections. As we expand our laboratory section offerings, we are hiring new adjunct colleagues who require equivalent, appropriate safety training options. We also participate in periodic department-wide laboratory safety sessions for all faculty, including adjunct faculty. We therefore request safety training funding on an ongoing basis in order to ensure we can reimburse all adjunct faculty for attending safety training sessions. Costs: \$1,500 to compensate adjuncts for attending; ongoing. Cost calculated for 4 years.

Personnel-Related:

No.

Resource Category:

Training

Quantity:

4

Unit Cost:

\$1,500.00

Total Cost:

\$6,000.00

Plant Reproduction Flower Specimens Request

Enhancement:

We request support for fresh flower specimens for all of our BIOL 101 and BIOL 170 laboratories; these courses are offered in multiple sections every semester. Flowers contain the reproductive structures and organs of angiosperm plants. BIOL 101 and BIOL 170 both rely on flowers from particular plant species so that students can perform dissections and learn about plant reproductive morphology. Each course is offered in multiple sections each semester, and until recently our technician and clerk have had to forage around the campus for flowers. Frequently the number and quality of available flowers were inadequate for all our sections. Recently, landscaping changes to the campus have eliminated our previous sources of flowers, meaning we must now purchase flowers for our students to dissect. Faculty in the Biology department have been spending personal funds and time to purchase flowers for individual classes because we do not have a sufficient regular supply source. This is a recurring material expense eligible for lottery funding in accord with Cal. Educ. Code §8880.5 and Cal. Educ. Code § 8880.7 that specify lottery funds shall be used for instructional materials and supplies. These materials are necessary for the curriculum of BIOL 101 and BIOL 170. The total cost is \$1,800 per year; 4 years are calculated below.

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

4

Unit Cost:

\$1,800.00

Total Cost:~~\$7,200.00~~**Operational Expenses Necessary for BIOL 272, A Majors' Course: DNA Extraction and Sequencing Reagents****Enhancement:**

BIOL 272 trains students in modern cell and molecular biology techniques, including DNA sequencing and PCR. These techniques require materials and expendable supplies on a recurring basis and the items listed therefore qualify for lottery funds in accord with Cal. Educ. Code § 8880.5 and Cal. Educ. Code § 8880.7 that specify lottery funds shall be used for instructional materials and supplies. BIOL 272 is offered in two sections each semester and trains biology majors in cellular and molecular biology techniques. The listed materials are necessary in order to complete the required curriculum. Students need these essential items to complete their lab work. Experiential learning and hands-on laboratory exercises are required in order for students to gain familiarity with lab equipment and lab techniques that are common and necessary in our discipline. The curriculum prepares students for transfer and/or entry into the workforce. This Operational Request is one of several that itemizes the costs for BIOL 272. These items are essential for offering the curriculum for a majors' course. Total costs are for 4 years until our next comprehensive Program Review. DNA sequencing requires Sanger sequencing reagents (\$229) and Instagene Matrix (\$330) to extract the DNA; sum is \$559 per semester + \$100 per semester for shipping = \$659 per semester or \$1318 annually.

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

4

Unit Cost:~~\$1,800.00~~**Total Cost:**

\$5,272.00

Operational Expenses Necessary for BIOL 272, A Majors' Course: PCR (Polymerase Chain Reaction) Reagents

Enhancement:

BIOL 272 trains students in modern cell and molecular biology techniques, including DNA sequencing and PCR. These techniques require materials and expendable supplies on a recurring basis and the items listed therefore qualify for lottery funds in accord with Cal. Educ. Code § 8880.5 and Cal. Educ. Code § 8880.7 that specify lottery funds shall be used for instructional materials and supplies. BIOL 272 is offered in two sections each semester and trains biology majors in cellular and molecular biology techniques. The listed materials are necessary in order to complete the required curriculum. Students need these essential items to complete their lab work. Experiential learning and hands-on laboratory exercises are required in order for students to gain familiarity with lab equipment and lab techniques that are common and necessary in our discipline. The curriculum prepares students for transfer and/or entry into the workforce. This Operational Request is one of several that itemizes the costs for BIOL 272. These items are essential for offering the curriculum for a majors' course. Total costs are for 4 years until our next comprehensive Program Review. PCR amplification of DNA requires PCR bead kits (\$1490) and New England Bio Taq Mastermix (\$361); sum is \$1851 per semester + \$100 per semester for shipping = \$1951 per semester or \$3902 annually.

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

4

Unit Cost:

\$3,902.00

TotalCost:

\$15,608.00

Operational Expenses Necessary for BIOL 272, A Majors' Course: Micropipette Tips

Enhancement:

BIOL 272 trains students in modern cell and molecular biology techniques, including DNA sequencing and PCR. These techniques require materials and expendable supplies on a recurring basis and the items listed therefore qualify for lottery funds in accord with Cal. Educ. Code §

8880.5 and Cal. Educ. Code § 8880.7 that specify lottery funds shall be used for instructional materials and supplies. BIOL 272 is offered in two sections each semester and trains biology majors in cellular and molecular biology techniques. The listed materials are necessary in order to complete the required curriculum. Students need these essential items to complete their lab work. Experiential learning and hands-on laboratory exercises are required in order for students to gain familiarity with lab equipment and lab techniques that are common and necessary in our discipline. The curriculum prepares students for transfer and/or entry into the workforce. This Operational Request is one of several that itemizes the costs for BIOL 272. These items are essential for offering the curriculum for a majors' course. Total costs are for 4 years until our next comprehensive Program Review. Micropipette tips (10 µl, 20 µl, 100 µl, 1000 µl) are necessary to perform all experiments and lab exercises in the curriculum requiring measured volumes below 1 ml. Cost is \$1800 per semester + \$100 shipping = \$1900 per semester or \$3800 annually.

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

4

Unit Cost:

\$3,800.00

TotalCost:

\$15,200.00

Operational Expenses Necessary for BIOL 272, A Majors' Course: Personal Protective Equipment

Enhancement:

BIOL 272 trains students in modern cell and molecular biology techniques, including DNA sequencing and PCR. These techniques require materials and expendable supplies on a recurring basis and the items listed therefore qualify for lottery funds in accord with Cal. Educ. Code § 8880.5 and Cal. Educ. Code § 8880.7 that specify lottery funds shall be used for instructional materials and supplies. BIOL 272 is offered in two sections each semester and trains biology majors in cellular and molecular biology techniques. The listed materials are necessary in order to complete the required curriculum and consists of the appropriate PPE (personal protective equipment) is also included for student safety. Students need these essential items to complete their lab work. Experiential learning and hands-on laboratory exercises are required in order for students to gain familiarity with lab equipment and lab techniques that are common and necessary in our discipline. The curriculum prepares students for transfer and/or entry into the workforce. This Operational Request is one of several that itemizes the costs for BIOL 272. These

items are essential for offering the curriculum for a majors' course. Total costs are for 4 years until our next comprehensive Program Review. These are Personal Protective Equipment (PPE) items for use in a molecular and cell biology laboratory. Laboratory gloves (sized S – XL) \$300 +\$50 shipping = \$350 per semester or \$700 annually

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

4

Unit Cost:

\$700.00

TotalCost:

\$2,800.00

Materials and Supplies for Tissue Culture (BIOL 196): Biological Gases

Enhancement:

Since the establishment of the Biotechnology Program in 2015, faculty have had to rely on ephemeral grants to support the needs of the Biotechnology program in laboratory materials and consumables. The program has grown, fostered cooperation among 4 Orange County colleges, created 4 certificates including a collaboration between Biotech and Administration of Justice, and supported dual enrollment relationships with high schools. Hundreds of students have gained certificates representing marketable skills and gone on to transfer, enter industry, join academic labs, enter graduate school, or enter professional schools including medicine and nursing. Current enrollment data indicate program strength has returned to pre-pandemic levels and interest is high. However, without stable funding the program is not sustainable. This request details one of several itemized costs necessary for the biotechnology program to continue functioning. This request concerns continued funding for BIOL 196, the Tissue Culture course. The course requires biological safety cabinets compliant with state and federal regulations to safely culture living cells; these cells require specialized biological gases. We request carbon dioxide and liquid nitrogen supplies, essential for maintaining cell cultures and for the operation of course equipment. Without these materials, the biotechnology curriculum cannot be offered. Demand for this program has been increasing, and these resources are critical to sustaining instruction. BIOL 196 is a required component of the Biotechnology Laboratory Technician Certificate. The necessary gas rentals and refills support the operation of equipment central to this course. Without them, BIOL 196 cannot run, and students cannot complete the Laboratory Technician Certificate. We therefore request lottery funds authorized under California Education Code §§ 8880.5 and 8880.7

and Title 5, California Code of Regulations §§ 59200–59208. The supplies require a specialist vendor who will rent and refill appropriate storage canisters on a routine basis. Supplies: CO₂ and N₂ tanks and refills, per year: \$6,000 or \$24,000 for 4 years until our next comprehensive Program Review.

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

4

Unit Cost:

\$6,000.00

TotalCost:

\$24,000.00

Safety and Legal Requirement for Tissue Culture (BIOL 196): Safety Cabinet Certification

Enhancement:

Since the establishment of the Biotechnology Program in 2015, faculty have had to rely on ephemeral grants to support the needs of the Biotechnology program in laboratory materials and consumables. The program has grown, fostered cooperation among 4 Orange County colleges, created 4 certificates including a collaboration between Biotech and Administration of Justice, and supported dual enrollment relationships with high schools. Hundreds of students have gained certificates representing marketable skills and gone on to transfer, enter industry, join academic labs, enter graduate school, or enter professional schools including medicine and nursing. Current enrollment data indicate program strength has returned to pre-pandemic levels and interest is high. However, without stable funding the program is not sustainable. This request details one of several itemized costs necessary for the biotechnology program to continue functioning. This request concerns continued funding for BIOL 196, the Tissue Culture course. The course requires biological safety cabinets compliant with state and federal regulations to safely culture living cells. We therefore request funding for the safety certification necessary for the safe and legal operation of course equipment. The biotechnology curriculum cannot be offered without biological safety cabinets. Demand for this program has been increasing, and these resources are critical to sustaining instruction. BIOL 196 is a required component of the Biotechnology Laboratory Technician Certificate. The necessary safety cabinets are essential and central to the curriculum. Without them, BIOL 196 cannot run, and students cannot complete the Laboratory Technician Certificate. We therefore request lottery funds authorized under California Education Code §§ 8880.5 and 8880.7 and Title 5, California Code of Regulations §§ 59200–59208. The certification

is legislated under Cal. Code Regs., Title 8, § 5154.2. Costs: \$700 annually for legally required biological safety cabinet certification according to Cal. Code Regs., Title 8, § 5154.2; \$2,800 for 4 years.

Personnel-Related:

No.

Resource Category:

Other

Quantity:

4

Unit Cost:

\$700.00

TotalCost:

\$2,800.00

Crime Scene Investigation and Forensic Biotechnology Supplies

Enhancement:

Our collaboration with Administration of Justice has resulted in the establishment of a state-recognized certificate program, and enrollment is strong. The Biotechnology Program has relied on ephemeral grants and yet has grown, fostered unprecedented cooperation among 4 Orange County colleges, created 4 certificates including a novel collaboration between Biotech and Administration of Justice, and supported dual enrollment relationships with several high school partner campuses. Current enrollment data indicate program strength has returned to pre-pandemic levels and interest is high. However, without stable funding the program is not sustainable on campus or at any of our dual enrollment sites. This need concerns on-going funding for consumables and instructional materials via lottery funds as provided by the legislative framework to increase enrollment. Including among underrepresented populations, non-traditional and re-entry students. This request is one of several itemized costs necessary to continue operating the biotechnology program and offering the relevant courses. We request necessary materials and supplies for which we have had to rely on grants up to this point. We request that these items, without which the classes would not be possible, be provided using lottery funds as provisioned by California law in Cal. Educ. Code § 8880.5, Cal. Educ. Code § 8880.7 and Cal. Code Regs. tit. 5, §§ 59200-59208. The certificates in question are CTE and the materials are used in the BIOL 190L curriculum targeted toward crime scene/forensic investigators. Crime Scene Investigator Kit 3X\$136=\$408; Forensic DNA Fingerprinting Kit 3X\$125=\$375; Total = \$783 per year. Costs shown below are for 4 years until our next comprehensive Program Review.

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

4

Unit Cost:

\$783.00

Total Cost:

\$3,132.00

Laboratory and Genetic Engineering Supplies for Biotechnology and Dual Enrollment

Enhancement:

The Biotechnology program has developed four certificates, including a joint Biotech–Administration of Justice option, and maintains dual enrollment partnerships with several high schools. Hundreds of students have earned certificates demonstrating marketable skills and have advanced to university study, industry positions, research labs, or professional programs in medicine and nursing. The program continued in-person instruction during the pandemic, producing biotechnicians who met urgent workforce needs. Enrollment has now returned to pre-pandemic levels and continues to grow, but without stable funding the program cannot remain viable on campus or at partner schools. These molecular biology reagents and kits are essential to the BIOL 190L, BIOL 191, BIOL 192, and BIOL 193 curriculum, and are necessary for students to perform DNA manipulation and analysis. The CRISPR and GMO kits provide hands-on experience in gene editing and genetic modification. Tag polymerase, restriction enzymes, ligase, and competent cells are required for DNA amplification, digestion, ligation, and transformation (core molecular cloning techniques). Gel green, agarose, and DNA ladders are used for electrophoretic analysis of DNA fragments. Luria broth and LB agar are necessary for bacterial culture. Mini and Midi Prep kits allow DNA purification for downstream applications, including DNA sequencing, which validates experimental outcomes. These materials are needed for class completion and achieving the required biotechnology competencies. In BIOL 193 they are also needed for our ongoing research collaboration, integrated into the BIOL 193 curriculum, with a CSUF biochemistry laboratory investigating the RNA-mediated regulation of gene expression. This request is one of several itemized costs necessary to continue operating the biotechnology program and offering the relevant courses. We request necessary materials and supplies for which we have had to rely on grants up to this point. We request that these items, without which the classes would not be possible, be provided using lottery funds as provisioned by California law in Cal. Educ. Code § 8880.5, Cal. Educ. Code § 8880.7 and Cal. Code Regs. tit. 5, §§ 59200-59208. The certificates in question are CTE. CRISPR Kit \$125, GMO Kit \$125, Tag polymerase

2X\$200=\$400, Gel green 2X\$100=\$200, Agarose \$750, Luria broth 500g \$125, LB agar 500g \$145, Competent cells 3X\$150=\$450, Mini Prep DNA Kit 1X\$150=\$150, Midi Prep DNA Kit 2X\$350=\$700, Restriction enzymes 3X\$70=\$210, Ligase 1X\$150=\$150, DNA ladder 2X\$150=\$300, and DNA sequencing \$1200; total is \$5,030 per year. We request annual support for the 4-year period until our next comprehensive Program Review.

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

4

Unit Cost:

\$5,030.00

TotalCost:

\$20,120.00

Protein Biochemistry, Flow Cytometry, and Immunochemistry Reagents for Biotechnology and Dual Enrollment

Enhancement:

The Biotechnology program offers four certificates, one in collaboration with Administration of Justice, and sustains dual enrollment partnerships with multiple high schools. Hundreds of students have completed certificates that validate job-ready skills and have progressed to universities, research institutions, biotechnology companies, and professional schools in medicine and nursing. The program maintained in-person instruction throughout the pandemic, supplying trained biotechnicians who filled critical workforce demands. Enrollment has recovered to pre-pandemic numbers and continues to increase, yet the program has had to rely on grant funding to meet its expenses annually. The program's continuation on campus and at partner sites is at risk without consistent funding. This request is one of several itemized costs necessary to continue operating the biotechnology program and offering the relevant courses. These molecular biology reagents and kits are essential to the BIOL 190L, BIOL 191, BIOL 192, BIOL 193 and BIOL 196 curriculum. The reagents support core instructional work in biotechnology, protein biochemistry, and tissue culture. Fluorescent antibodies and flow cytometry reagents enable analysis of protein expression and cell characteristics. Protein gels, Western kits, and molecular weight markers such as Kaleidoscope teach protein separation, detection, and quantification. Together they provide essential materials for students to learn fundamental laboratory techniques used in research and industry. We request necessary materials and supplies for which we have had to rely on grants up to this point. We request that these items, without which the classes would not be possible, be provided using lottery funds as provisioned by California law in Cal. Educ. Code § 8880.5, Cal.

Educ. Code § 8880.7 and Cal. Code Regs. tit. 5, §§ 59200-59208. The courses and certificates in question are CTE. Supplies include: Fluorescent antibodies 2X\$500=\$1000, Protein Gels 2X\$120=\$240, Western Kit 2X\$235=\$470, Kaleidoscope 2X\$143=\$286, and Flow cytometry reagents 1X\$300=\$300; total = \$2,296 per year. We request support for 4 years until our next comprehensive Program Review.

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

4

Unit Cost:

\$2,296.00

TotalCost:

\$9,184.00

Funding for Recruiting and Onboarding/Training Adjuncts

Enhancement:

Recruiting and retaining trained adjunct faculty who can help us meet GE needs and free our full-time faculty to focus more on the impacted majors' and certificate courses is very challenging. We are actively pursuing new adjunct faculty hires and need to compensate adjunct faculty who receive onboarding training as well as full-time faculty who train new colleagues. We are therefore requesting operational funding to recruit and train adjunct faculty. We request a small ongoing budget to provide funding for recruiting adjunct faculty and training them so that our courses maintain the necessary consistency, quality, and equity. These funds would support under PE hourly contracts the efforts of biology faculty to recruit adjunct colleagues at events such as "mini job fairs" or department events to raise awareness of our program among qualified biologists. Additionally, biology faculty would organize onboarding camps during which new adjunct faculty would become acclimated with our course requirements, curriculum, standards, pedagogical techniques, and delivery methods for the particular sections to which they are assigned. The funds would also support the adjunct faculty attending the onboarding sessions. We request 30 work hours for recruitment and onboarding efforts at PE (professional expert) rates, recurring as needed for hiring, training and retaining adjunct colleagues; \$1,650 per semester = \$3,300 annually. We request 4 years of support.

Personnel-Related:

We face ongoing difficulty attracting and retaining qualified adjunct faculty who can help meet general education needs and allow full-time instructors to concentrate on high-demand major and

certificate courses. We are working to raise awareness of teaching opportunities in our department. To support incoming adjunct faculty, we plan to use the expertise of our full-time instructors to provide concise, targeted training in effective and equitable teaching practices. We therefore request operational funding to recruit and prepare adjunct faculty. 30% of our CRNs were taught by adjuncts in Fall, 2024. Our full time faculty are decreasing; we have lost 5 full time faculty since 2017 and will lose a 6th in 2026. Meanwhile demand for our courses is increasing. This makes it crucial for us to not only attract but also train high quality adjunct instructors who can deliver our curriculum safely and equitably. We are finding it increasingly difficult to find adjunct faculty for our general education classes, including BIOL 101, BIOL 102, and BIOL 190/190L (biotechnology, including dual enrollment). Several of our well-qualified adjuncts have left, and it is rare to find qualified replacements. In parallel our average class size at census in Fall 2024 indicates full sections and we anticipate increased demand moving forward while the number of full-time faculty continues to drop.

Resource Category:

Training

Quantity:

4

Unit Cost:

\$3,300.00

Total Cost:

\$13,200.00

Tissue Culture Materials and Reagents for BIOL 196, an Advanced Biotechnology Course

Enhancement:

The Biotechnology program offers four certificates, one in collaboration with Administration of Justice, and sustains dual enrollment partnerships with multiple high schools. Hundreds of students have completed certificates that validate job-ready skills and have progressed to universities, research institutions, biotechnology companies, and professional schools in medicine and nursing. The program maintained in-person instruction throughout the pandemic, supplying trained biotechnicians who filled critical workforce demands. Enrollment has recovered to pre-pandemic numbers and continues to increase, yet the program has had to rely on grant funding to meet its expenses annually. The program's continuation on campus and at partner sites is at risk without consistent funding. This request is one of several itemized costs necessary to continue operating the biotechnology program and offering the relevant courses. These tissue culture reagents and materials are essential to the BIOL 196 curriculum. The reagents support core instructional work in biotechnology and tissue culture. BIOL 196 is a required component of the Biotechnology Laboratory Technician Certificate. The items listed are essential and central to the

curriculum. Without them, BIOL 196 cannot run, and students cannot complete the Laboratory Technician Certificate. We request necessary materials and supplies for which we have had to rely on grants up to this point. We request that these items, without which the classes would not be possible, be provided using lottery funds as provisioned by California law in Cal. Educ. Code § 8880.5, Cal. Educ. Code § 8880.7 and Cal. Code Regs. tit. 5, §§ 59200-59208. The courses and certificates in question are CTE. These reagents support various stages of cell culture and analysis. Tissue culture plates provide a substrate for cells to grow, and tissue culture media and RPMI provide nutrients and conditions/effectors for propagating cell lines. Serum provides water, proteins and growth factors. Trypsin is used to detach adherent cells for subculturing or experimental use. RIPA buffer is used for cell lysis and protein extraction for downstream assays, and Lipofectamine allows the transfection of polynucleotides into cells for gene expression or silencing studies. Culture plates 3X\$450=\$1350, Tissue culture media 2X\$260=\$520, RPMI 6x500mL \$301, RIPA (5X) 100mL \$207, Serum 3X\$300=\$900, Trypsin (box) 1X\$150=\$150, and Lipofectamine 1X\$200=\$200; total = \$3,628. We request support for 4 years until our next comprehensive Program Review.

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

4

Unit Cost:

\$3,628.00

TotalCost:

\$14,512.00

Chromatography and Protein Purification Reagents for Biotechnology and Dual Enrollment

Enhancement:

The Biotechnology program offers stackable certificates and includes dual enrollment partnerships with multiple high schools. The program's continuation on campus and at partner sites is at risk without consistent funding. These supplies and reagents are essential to the BIOL 190L, BIOL 191, BIOL 192, BIOL 193 and BIOL 196 curriculum. The reagents support core instructional work in biotechnology, protein biochemistry, and tissue culture. These supplies are essential for protein purification and analysis. Ammonium sulfate is used for protein precipitation and fractionation, and the size exclusion chromatography kits separate proteins based on molecular size, allowing for purification and downstream characterization. We request necessary materials and supplies for which we have had to rely on grants up to this point. We request that

these items, without which the classes would not be possible, be provided using lottery funds as provisioned by California law in Cal. Educ. Code § 8880.5, Cal. Educ. Code § 8880.7 and Cal. Code Regs. tit. 5, §§ 59200-59208. The courses and certificates in question are CTE. This request is one of several itemized costs necessary to continue operating the biotechnology program and offering the relevant courses. Supplies: Ammonium sulfate 2.5kg 1X\$200=\$200 and Size exclusion chromatography kit 2X\$185 = \$385. We request support for 4 years until our next comprehensive Program Review.

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

4

Unit Cost:

\$385.00

TotalCost:

\$1,540.00

Consumables, Liquid Handling, and Personal Protective Equipment (PPE) for Biotechnology and Dual Enrollment

Enhancement:

The Biotechnology program has stackable certificates and offers dual enrollment courses at several high schools. The program's continuation on campus and at partner sites is at risk without consistent funding. These items are essential to the BIOL 190L, BIOL 191, BIOL 192, BIOL 193 and BIOL 196 curriculum. These consumables support safety and efficacy during routine laboratory operations and ensure accuracy, sterility, and safety in experimental workflows. Pipette tips of various sizes (p10, p20, p200, and p1000) are required for precise liquid handling. Conical tubes (15 mL and 50 mL) are used for sample preparation, storage, and centrifugation. Gloves in multiple sizes provide necessary protection for personnel and samples during all experimental procedures; gloves are considered personal protective equipment and are a safety requirement. These are all routinely used and necessary lab materials. We request necessary materials and supplies for which we have had to rely on grants up to this point. We request that these items, without which the classes would not be possible, be provided using lottery funds as provisioned by California law in Cal. Educ. Code § 8880.5, Cal. Educ. Code § 8880.7 and Cal. Code Regs. tit. 5, §§ 59200-59208. The courses and certificates in question are CTE. This request is one of several itemized costs necessary to continue operating the biotechnology program and offering the relevant courses. Supplies: p20 tips 20X\$30=\$600, P200 tips 20X\$30=\$600, P1000 tips

20X\$30=\$600, p10 tips 10X\$30=\$300, 50mL conical 2X\$600=\$1200, 15mL conical 2X\$600=\$1200, and Gloves (10 pack X\$200 in XS, S, M, L, XL) 6X\$200=\$1200; total = \$5,700 annually. We request support for 4 years until our next comprehensive Program Review.

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

4

Unit Cost:

\$5,700.00

TotalCost:

\$22,800.00

Serological and General Laboratory Glassware for Biotechnology and Dual Enrollment

Enhancement:

The Biotechnology program offers stackable certificates and includes dual enrollment partnerships with multiple high schools. The program's continuation on campus and at partner sites is at risk without consistent funding. We have had to rely on ephemeral grants to run the program for many years, and need stable funding to continue. These consumables and supplies are essential to the BIOL 190L, BIOL 191, BIOL 192, BIOL 193 and BIOL 196 curriculum. They are needed for accurate liquid measurement and sterile handling in cell culture and biochemical experiments. The serological pipettes in 5ml, 10 mL, and 25 mL volumes are required for precise transfer of reagents, media, and samples, supporting consistency and reliability across experimental procedures. These materials are used routinely in lab work. We request necessary materials and supplies for which we have had to rely on grants up to this point. We request that these items, without which the classes would not be possible, be provided using lottery funds as provisioned by California law in Cal. Educ. Code § 8880.5, Cal. Educ. Code § 8880.7 and Cal. Code Regs. tit. 5, §§ 59200-59208. The courses and certificates in question are CTE. Supplies: Serological 5mL pipettes 10X\$170=\$1700, Serological 10mL pipettes 10X\$170=\$1700, and Serological 25mL pipettes 5X\$350=\$1750.; total = \$5,150 annually. We request support for 4 years.

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

4

Unit Cost:

\$5,150.00

TotalCost:

\$20,600.00

Polyacrylamide Gel Electrophoresis Supplies for Biotechnology and Dual Enrollment**Enhancement:**

The Biotechnology program offers stackable certificates and includes dual enrollment partnerships with multiple high schools. The program's continuation on campus and at partner sites is at risk without consistent funding. We have had to rely on grants and ephemeral funding for many years and the program cannot continue without stable funding. These consumables and supplies are essential to the BIOL 190L, BIOL 191, BIOL 192, BIOL 193 and BIOL 196 curriculum. PAGE gels are used for protein separation and analysis by electrophoresis, enabling assessment of protein purity, molecular weight, and expression levels in biochemical and molecular biology experiments. These materials are used routinely in lab work. We request necessary materials and supplies for which we have had to rely on grants up to this point. We request that these items, without which the classes would not be possible, be provided using lottery funds as provisioned by California law in Cal. Educ. Code § 8880.5, Cal. Educ. Code § 8880.7 and Cal. Code Regs. tit. 5, §§ 59200-59208. The courses and certificates in question are CTE. This request is one of several itemized costs necessary to continue operating the biotechnology program and offering the relevant courses. Supplies: PAGE Gels PAGE \$150 per box X 6 boxes = \$900 annually. We request support for 4 years until the next comprehensive Program Review.

Personnel-Related:

No.

Resource Category:

Supplies

Quantity:

4

Unit Cost:

\$900.00

TotalCost:

\$3,600.00

