CALIFORNIA STATE UNIVERSITY
LONG BEACH
Office of the Vice Provost for Academic Programs

Memorandum of Understanding

This MOU has been read and approved by:

Department Chair: Jesse Dillon Date: 11/13/2025
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Program Review Summary
Memorandum of Understanding
Department of Biological Sciences
College of Natural Science and Mathematics
November 2025

This document serves as a summary of the Program Review findings and a Memorandum of Understanding (MOU) outlining the consensus reached by the Department of Biological Sciences, the College of Natural Science and Mathematics, and the Division of Academic Affairs, based on the recently conducted program review with a Self-study received in July 2022. Drs. Vrendenburg and Huxman completed the external review in December 2024. This report and MOU describe the goals to be achieved and the actions to be undertaken by all parties during the next program review cycle.

The Department of Biological Sciences offers BS degrees in Biological Sciences, Marine Biology, and Microbiology. Within the BS in Biological Sciences, there are four options: General Biology; Molecular Cell Biology, and Physiology (MCBP); Biology Education; and Zoology, Botany and Ecology (previously known as "Organismal Biology"). The Department offers MS degrees in Biological Sciences and Microbiology. In addition, the department offers Minors in Biology and Microbiology, as well as Certificates in Biomedical Illustration Prep and Biotechnology, which are not under the purview of this review.
The program's previous MOU was signed in 2017, with the following recommendations that the department will: 1) conduct an analysis of time to degree in both the undergraduate and graduate degrees, and will develop plans to decrease time to degree for native, transfer, and graduate students; 2) develop an assessment plan for the graduate program that includes a curriculum map that is linked to student learning outcomes and that notes formative and summative assessments. Findings will be reported to the Vice Provost and Director of Program Review and Assessment according to the regular assessment schedule; 3) continue to monitor the progress and viability of the MS in Microbiology program; and, 4) provide a biennial update on progress made towards the actions agreed to in this MOU, to be submitted in conjunction with its biennial assessment report.

The department has met the terms of the 2017 MOU in regard to assessment completion and reporting. During the review period, the department formed an assessment committee, created an assessment plan, and filed assessment reports. Additionally, the department assessed student success metrics and the viability of the MS in Microbiology degree, reported later in this MOU.

Resources reviewed for the report:

1. Self-study report 2022
2. External review report 2024
3. Previous MOU 2017
4. Department of Biological Sciences catalog and website

Strengths Identified in the Reports

1. **Graduation Rates- First-Time, First-Year (FTFY) Students**. The department achieved a dramatic increase in 4-year graduation rates, rising from 23% for the Fall 2015 cohort to 40% for the Fall 2020 cohort. At the same time, it maintained overall 4-year and 6-year graduation rates comparable to the campus average (40% for 4-year, matching the campus average, and 74% for 6-year, compared to 69% campus-wide). Student-based FTES also grew significantly, increasing by 70% from 1,106 in 2016 to 1,882 in 2024. Despite a shrinking number of tenure-track faculty, external reviewers praised the department's commitment to instructional quality by offering a full schedule of upper division courses to meet the needs of biological sciences majors. These efforts have led to a substantial increase in the number of baccalaureate degrees awarded in biological sciences, which grew from about 200 in 2015/16 to nearly 400 in 2024/25. In the CSU-wide context, CSULB is now the top campus for baccalaureate degrees in biological sciences, producing 10% of all CSU undergraduate degrees in the field in 2024/25, up from 5.6% in 2014/15.
2. **Growth in Class-Based FTES**. Undergraduatte class-based FTES increased 36%, rising from 867 in AY 2016-17 to 1229 in AY 2024-25. This growth was largely driven by major course enrollment. By contrast, non-major and graduate/ post-baccalaureate enrollments remained relatively constant and therefore declined as a percent of total department FTES. This increase was observed across all of the department's degree offerings, but most notably in the BS in Biology program.
3. **Student Research Training Programs**. The department faculty and students participate in several federally funded training programs that introduce historically underrepresented students to careers beyond medicine. These include the NIH-funded Building Infrastructure Leading to Diversity (BUILD), Minority Access to Research Careers-Undergraduate Student Training in Academic Research (MARC U*STAR), and Research Training Initiative for Student Enhancement (RISE) programs. The MARC and RISE programs have been unified into a new program called Undergraduate Research Training Initiative for Student Enhancement (U-RISE). In addition, Biological Sciences students are also supported in other programs, such as Louis Stokes Alliance for Minority Participation (LSAMP) and METRIC Scholarship programs funded by NSF and the McNair Scholars Program (US Dept. of Ed.). There is also a lower-division Undergraduate Research Opportunities program (UROP) in which freshman and

sophomores can begin to gain research experience paid research experience. These programs offer financial support, travel to professional conferences (e.g., SACNAS and ABRCMS), and mentoring to prepare students for doctoral study in biomedical fields. During the review period, the department estimates that over 100 Biological Sciences majors participated in these programs.

4. **Advancing Inclusive Mentoring (AIM)**. Faculty member Dr. Kelly Young is commended for her leadership in developing and implementing the Advancing Inclusive Mentoring (AIM) program, also known as Beach Mentor, at CSULB. AIM provides faculty training and resources to promote student success through inclusive, evidence-based mentoring practices.
5. **Pre-Professor Program (PREPP)**. The department has been actively engaged with the Pre-Professor Program (PREPP), which brings diverse doctoral students and postdocs from UC Irvine to explore faculty careers at research-active, comprehensive universities like the CSU. The semester-long program includes campus visits, meetings with faculty and department chairs, and opportunities to give a guest lecture. The Department of Biological Sciences has hosted multiple PREPP fellows in recent years, including one each semester during the 2022–2023 academic year.
6. **High-Impact Practices (HIPs)**. The department provides undergraduates with a variety of High-Impact Practices for academic credit, including off-campus internships, laboratory teaching, directed research, study abroad, marine biology field courses, and service-learning opportunities.
7. **Facilities and Resources**. During the review period, the department made significant upgrades to facilities and resources. Renovations to the Microbiology building included HVAC improvements to enhance air quality and safety. Several teaching classrooms were upgraded with HyFlex technology, and numerous laboratory instruments were replaced or added. Major investments included replacement of Vertebrate Specimens Collection cabinetry (eliminating older lead-based cabinets), electrical upgrades to one of the two campus greenhouses, purchase of a Nikon TIRF Confocal Microscope, and installation of three new autoclaves.
8. **Expanded Faculty Advising Support**. The College increased funding to the department, enabling the appointment of six tenure-track faculty dedicated to advising students across the major degree options. Faculty advisors collaborate with the CNSM Advising Center and SAS Center in ensuring holistically integrated student support system.
9. **Teacher-Researcher Model**. The department's teacher-researcher model, central to its success, enhances student learning while fostering collaboration with the broader community.
10. **Multi-Year Assessment Plan**. The department has developed a Multi-Year Assessment Plan, grounded in revised Program Learning Objectives, which provides a framework for meaningful and achievable assessment. The self-study includes appendices of annual

assessments completed during the review period and highlights two "closing-the-loop" initiatives that directly informed curriculum modifications to improve student success.

11. **Community Outreach Through Research**. The department creatively leverages faculty research laboratories for community outreach events (e.g., visits by K-12 groups), strengthening the connection between research resources and student learning.

Concerns Noted in the Reports:

1. **Faculty Capacity and Student Access**. While departmental student-based FTES have increased by 70% (2016-2024), the number of baccalaureate degrees has doubled, and the class-based FTES have increased by 36% as the number of tenured/tenure-track (T/TT) faculty has declined from 31.3 to 27.8. During that time period, the number of FTE of lecturer faculty has increased from 10.1 to 25 resulting in a decline in tenure density from 75% to 53%. As a result, the student-to-faculty ratio increased from 15.7 to 19.3, which remains slightly below the campus average of 20.1. However, because core curriculum and upper division elective courses are increasingly taught by lecturer faculty, the department is concerned that reduced student access to T/TT faculty may limit opportunities to engage with instructors actively involved in research.
   The external reviewers expressed concern that the program may be reaching a critical point where reductions in the ratio of tenure-track faculty to biology majors could begin to affect the consistent high quality of education. They noted that growing enrollment and increased reliance on temporary faculty may lessen students' access to the research-driven instructional model that is central to the program's strength.
2. **Graduate Program Enrollments**. Graduate headcounts have remained relatively stable, averaging 16-17 MS students in Biology and 2-6 MS students in Microbiology per year. Despite recommendations in the prior MOU to grow the MS in Microbiology, enrollments have not increased. The department anticipates that the hiring of new faculty will help boost enrollment, but as a low-enrollment, low-degree conferring program, the department is required to develop a formal plan and report yearly progress to the CSU Chancellor's Office.

Opportunities for Development Identified in the Reports

1. **Student Success**
   a. Units and Time to Degree-Undergraduate Programs. The average number of units earned for bachelor's degrees decreased from 150.1 to 140.4, and the average time to graduation dropped from 5.3 years to 4.4 years. These improvements have contributed to impressive gains in graduation rates, particularly for 4-year completions (8% to 20% within major graduation and 23% to 40% in 4Y graduation rate). Additional gains will likely require improvements in persistence rates. [Note: The self-study mistakenly listed

GI 2025 goals of 138 and 132 units; the correct CSU systemwide goal is to trend toward 120 units.]

b. Persistence Rates within Major. One- and two-year persistence rates for FTFY students within major remain low, with roughly half of Biology pre-majors leaving the major. The department attributes this attrition primarily to challenges in required non-Biology courses in Mathematics (Math 119A) and Chemistry (CHEM 111A/B). Many students who do not test into or pass these courses exit the major early. It should be noted that this dynamic is similar to challenges observed on other CSU campuses.
c. Equity Gaps. Equity gaps in graduation and persistence rates persist between underrepresented minority (URM) students and non-URM students, particularly in the first two years. However, students who succeed in their pre-major requirements and advance to the fifth semester show reduced equity gaps, with comparable rates of success to their peers. It is also important to contextualize this by comparison with other Biology Degree programs within the CSU. As noted above, the CSULB Biological Sciences Department has graduated more majors than any other CSU campus for the last four years. Importantly, the department has also graduated more URM Biological Sciences majors than any other CSU campus in 3 of the last 4 years.
d. Transfer Student Outcomes. Graduation rates for transfer students improved from 30% for F19 cohort to 37% for F22 cohort (two-year) and 81.7% (four-year). Average time to degree decreased from 3.3 years (2015-2016) to 2.5 years (2021-2022). While encouraging, these remain below GI 2025 targets of 49% and 91%, respectively. Units earned by transfer students fluctuate between 160–174 total units.
e. Graduate Student Outcomes. Average time to degree has improved in both the MS in Biology and MS in Microbiology programs. MS in Microbiology: now completable in two years, though small enrollments (n = 2-6) should be noted. MS in Biology: average time to degree decreased slightly to 3.4 years in 2021–2022, with students averaging 32.4 units.
f. Course Completion and DFW Rates. Two non-major courses (BIOL 207, BIOL 208) and three major courses (BIOL 213, BIOL 260, BIOL 342) consistently show high DFW rates. Faculty in BIOL 213, 260, and 342 implemented culturally relevant practices to support student success. BIOL 260 and BIOL 342 faculty also participated in the DFW Curricular Study Program (Fall 2022). As a result, all three courses lowered their DFW rates in Spring 2023. Continued interventions and outcome assessments are encouraged, along with collaboration with Allied Health faculty to address high DFW rates in BIOL 207 and 208.
g. Faculty Diversity. The department has revised faculty hiring practices to better align faculty demographics with CSULB's diverse student population. However, recent retirements and departures of tenure-track faculty have delayed progress. Continued efforts to diversify future hires are strongly encouraged. Note: it is encouraging that

since the initial study was submitted the department has successfully hired two Black faculty (including a CSULB Biology Alumnus), demonstrating their commitment to improving faculty diversity.

Recommendations

It is therefore agreed that the Department of Biological Sciences will collaborate with the College of Natural Science and Mathematics and Division of Academic Affairs to:

1. Continue implementing the department's comprehensive assessment plan, ensuring annual assessments use both direct and indirect methods. Report on "closing-the-loop" activities to demonstrate how learning outcome data inform decision-making. Provide annual updates (due June 1) on progress toward MOU actions to the CLA Dean, Vice Provost for Academic Programs, and Coordinators of Program Review and Assessment. The current review cycle spans 2022-2029, with the next comprehensive self-study due June 2029 for the 2029-2030 review process.
2. Continue to implement the recent hiring plan to meet student needs and increase faculty diversity so that faculty demographics more closely reflect the student population.
3. Implement a plan and report yearly progress to Academic Affairs and the CSU for the low-enrolling, low-degree conferring MS in Microbiology program, with a goal of graduating at least five students per year.
4. Develop and implement a plan to improve first- and second-year persistence for bachelor's degree programs. The plan should assess whether curricular or support interventions can increase the number of students advancing from pre-major status into the degree program.
5. Continue interventions and assessment of outcomes aimed at reducing DFW rates in BIOL 213, BIOL 260, and BIOL 342. Collaborate with Allied Health faculty to revise BIOL 207 and BIOL 208 to improve DFW rates in these high-enrollment, non-major courses.
6. Develop an assessment plan for graduate programs similar to that of the undergraduate program, in order to better understand graduate student demographics, needs, performance, and opportunities. Update graduate Program Learning Outcomes (PLOs) to better serve students and continue improving time to degree so that program outcomes align more closely with student goals.

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