Memorandum of Understanding

This MOU has been read and approved by:

Associate Dean and Program Chair: Kerop Janoyan Date: 3/19/2026

Kerop Janoyan

Dean, College of Engineering: Jinny Rhee Date: 3/19/2026

Jinny Rhee

Vice Provost Academic Programs: Date: 3/19/2026

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Program Review Summary
Memorandum of Understanding

Ph.D. Program in Engineering and Computational Mathematics
College of Engineering
December 2025

This document serves as a summary of the Program Review findings and a Memorandum of Understanding (MOU) outlining the consensus reached by the Ph.D. program in Engineering and Computational Mathematics, the College of Engineering, and the Division of Academic Affairs. It is based on the Self-Study submitted in December 2024, the external program review visit conducted on February 13 and 14, 2025, and the external reviewer report received in March 2025. This report and MOU describe the goals to be achieved and the actions to be undertaken by all parties to this agreement during the next program review cycle. Progress toward these goals will be addressed in the annual report.

The Joint Ph.D. program in Engineering and Computational Mathematics is offered by Claremont Graduate University (CGU) and the College of Engineering at California State University, Long Beach (CSULB). Students take mathematics courses at CGU and engineering courses in the College of Engineering at CSULB. There are no formal concentrations within the degree; however, students may choose engineering courses and conduct research in their area of specialization. The program requires 72 units of mathematics and engineering coursework beyond the bachelor's degree and permits the transfer of up to 24 units of approved graduate coursework for students entering with a master's degree. A minimum of 24 units must be completed at CSULB and another 24 units at CGU. The program was approved by the CSULB Academic Senate in 1987 and awarded its first doctoral degree in 1995. In 2018, the degree name was changed from "Ph.D. in Engineering and Industrial Applied Mathematics" to "Ph.D. in Engineering and Computational Mathematics."

The program was last reviewed in 2018, with the MOU issued in May 2019. The recommendations to the program were to: 1) Articulate a mission statement and Program Learning Outcomes on the website; 2) Continue their ongoing program of assessment of institutional, programmatic, and student learning outcomes across the curriculum; 3) Provide an annual update on progress made towards the actions agreed to in this review, with a comprehensive self-study due June 2023; 4) Re-evaluate the course offerings and required courses for the Ph.D. program to increase graduation rates with a target of 5 or more graduates per year; 5) Increase industry internship opportunities and industry-sponsored projects for Ph.D. dissertations; 6) Organize all-student and faculty advisor-inclusive program events; and 7) As resources permit, secure funding to establish a Ph.D. student research fellowship program. The program has not made significant progress toward meeting the recommendations from the last MOU.

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The recommendations to Academic Affairs and the College of Engineering were to provide funding to support the improvement of graduate student culture. Specifically, Academic Affairs committed non-renewable baseline funding to support both M.S. and Ph.D. students, as well as faculty mentoring of Ph.D. students. This funding decreased incrementally over four years, beginning with $60,000 in 2019-2020, $40,000 in 2020-2021, $20,000 in 2021-2022, and $0 in 2022-2023 and thereafter, with the expectation that faculty would secure external grant funding to sustain this support. In addition, Academic Affairs provided a flat rate of $10,000 for each Ph.D. student graduated annually, with the understanding that a significant increase in graduates (10 or more per year) would trigger renegotiation. This funding was intended to reduce faculty teaching loads and enable faculty to (1) compete for and secure external grants to support Ph.D. students as teaching or research assistants, (2) increase faculty and student publications and conference presentations, and (3) advance faculty scholarly agendas in alignment with College Dean's office standards. Academic Affairs has successfully met the recommendations from the last MOU.

Resources reviewed for the report:

1. Self-study 2024
2. External review 2025
3. MOU 2019
4. University Catalog and College of Engineering websites

Strengths Identified in the Reports

- **External Funding for Research**. The College of Engineering has been successful in securing substantial external funding over the past six years, including grants from the Denso Foundation, Edwards Air Force Base, NIH BUILD, and the Port of Long Beach. This funding has supported the establishment of specialized research laboratories and access to advanced equipment, enabling Ph.D. students to conduct high-level research in areas such as biomedical engineering, high-performance computing, and polymer research.
- **Scholarly Publication Requirement**. The program sets a rigorous standard for research productivity by requiring students to complete at least three refereed publications (conference or journal) prior to graduation. This emphasis on publishing prepares students for academic and industry careers while enhancing the visibility and impact of the program's research contributions. Students are also encouraged to present their work at national and international conferences.
- **Interdisciplinary collaboration**. The program offers a distinctive interdisciplinary model that integrates mathematics and engineering while maintaining a balance between theory and practice. This approach fosters co-authorships, co-mentorships, and collaborative research across disciplines.

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Concerns Noted in the Reports

- **Assessment**. Although the program asserts that it has "robust outcome assessment practices," no assessment reports have been submitted to substantiate this claim. The absence of documented assessments makes it difficult to evaluate how effectively the program measures student learning outcomes or uses assessment results to inform program improvements.
- **Enrollments**. The program reports a consistent average enrollment of approximately 17 students per semester; however, CSULB Institutional Research & Analytics (IR&A) data indicates fluctuations in new enrollments from year to year, suggesting inconsistency in attracting new students. The program typically receives 15-18 applications annually, admits 2-4 students, and ultimately enrolls only 0-2 students. These figures may not be fully accurate if CGU maintains separate records. Coordinated data collection across both institutions is essential to ensure accurate and comprehensive enrollment tracking. Current trends raise concerns regarding the program's long-term sustainability.
- **Graduation Rate and Time to Degree**. No clear trend is evident in either graduation rates or time to degree. Limited data is available for the 2019-20 and 2020-21 academic years, and this data appears inconsistent with IR&A records. Furthermore, with an average enrollment of 17 students but only one new student admitted per year, it suggests that students are remaining in the program for extended periods before graduating.
- **Progress Monitoring System**. CSULB lacks an efficient system for tracking and monitoring student progress, creating gaps in student records, particularly when students take courses at CGU. The program would benefit from a well-organized tracking system to monitor persistence, graduation rates, and demographic data.
- **Insufficient Student Support.** Under the current advisement model, students report feeling disconnected from both institutions at the outset of the program. They also perceive that research is not treated as a program priority and express frustration with the lack of infrastructure support for their research, particularly with respect to manufacturing and IT resources.
- **Financial Barrier.** The cost differential between coursework at CGU (a private institution) and CSULB (a public university) creates a significant financial burden for prospective and current students, especially in the absence of adequate financial support.

Opportunities for Development noted in the Reports

- **Streamline the Admission Process**. Currently, applicants must apply separately to CSULB and CGU, with CGU making the initial admission decision before CSULB grants final approval. External reviewers recommended that the program consider reversing this process and assess the feasibility of such a model.

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Recommendations:

It is therefore agreed that the College of Engineering and the Division of Academic Affairs, will:

1. Submit an annual assessment report, due September 1, via Nuventive, documenting progress made toward the actions agreed to in this MOU. Reports will be submitted to the COE Dean, the Vice Provost for Academic Programs, and the Coordinators for Program Review and Assessment. The review cycle will cover the period from 2023–2030, with a comprehensive self-study due in June 2030 to support the 2030–2031 academic year program review process.
2. Establish a clear mission statement and measurable program learning outcomes to guide program direction and ensure alignment with institutional goals.
3. Address concerns regarding the program's lack of clear direction and insufficient institutional support. The College and University should carefully assess their level of commitment to sustaining the Ph.D. program.
4. Continue to track and analyze student success data as additional cohorts progress through the program. If graduation rates fail to meet established targets, develop and implement a strategic plan to improve outcomes.

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