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

Memorandum of Understanding

This MOU has been read and approved by:

Associate Dean: Kerop Janoyan Date: 5/13/2025

Kerop Janoyan

Dean, College of Engineering : Jinny Rhee Date: 5/13/2025

Jinny Rhee

Interim Vice Provost Academic Programs: Pei-Fang Hung Date: 5/13/2025

Pei-Fang Hung

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Program Review Summary
Memorandum of Understanding
Master of Science in Computer Science
Department of Computer Engineering and Computer Science
College of Engineering
May 2025

This document serves as a summary of the Program Review findings and a Memorandum of Understanding outlining the consensus reached by the Department of Computer Engineering and Computer Science (CECS), the College of Engineering, and the Division of Academic Affairs, based on the recently conducted program review with a Self-study received in March 2023 (due 2021). Dr. Shangping Ren (San Diego State University) and Dr. Eun-Young Elaine Kang (CSU, Los Angeles) completed the external review in April 2023. This Memorandum of Understanding (MOU) outlines the goals to be achieved and the actions to be undertaken by all parties involved during the upcoming program review cycle. Progress toward goals is to be addressed in an annual report.

Throughout this program review cycle, the Department of Computer Engineering and Computer Science (CECS) offers BS degree in Computer Science and BS in Computer Engineering, as well as MS degree in Computer Science (MSCS) with Option in Computer Science and Option in Computer Engineering. The BS degrees are accredited and reviewed by ABET (Accreditation Board for Engineering and Technology), so these are not reviewed in this report. The MS in Computer Science, Option in Computer Engineering was discontinued in 2023 after being suspended for several years due to low enrollments. The MSCS program consists of 30 units, including a 15-unit core. Students who choose the comprehensive examination option complete 15 units of electives, while those selecting the thesis option complete 9 units of electives and 6 units dedicated to the thesis. No previous Memorandum of Understanding (MOU) was found for the MSCS program.

Resources reviewed for the report:

1. Self-study July 2022
2. External review April 2023
3. Department of Computer Engineering and Computer Science (CECS) website

Strengths were identified in the reports

- The MSCS program has a 2-year graduation rate ranging from 59.6% to 78.8%, and a 3-year graduation rate ranging from 76.7% to 88%. These 2- and 3-year graduation rates of the MSCS program have been consistently higher than other programs in the college,

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such as Chemical Engineering, Electrical Engineering, and Mechanical And Aerospace Engineering.

- Average units earned range from 32.5 to 35.3, taken in an average number of years ranging from 1.9 to 2.4. This indicates that the students are taking the appropriate courses and graduating in 4-5 semesters.
- The application rates for the MSCS program have shown a significant increase, with an unusual spike observed for Fall 2022. Despite the fluctuations in application rates, the yield rates have remained steady at 30%.
- The headcounts of graduate majors in the MSCS program have been positive, indicating a healthy level of enrollment, but there is a significant and rapid growth in the past 2-3 years.
- The MSCS program offers employment as Teaching Associates and Instructional Student Assistants to about a dozen graduate students starting in their second semester. These positions involve teaching labs for lower-division programming courses and grading for upper-division courses. They provide classroom experience and an income to help cover expenses. Graduate students also have the opportunity to be hired as Research Assistants by faculty with research grants

Concerns were noted in the reports

1. The ratio of graduate students to tenure-line faculty in the MSCS program has steadily increased, rising from 7:1 to 13:1 over time. Both the overall student-to-faculty ratio and the graduate student-to-faculty ratio have reached significantly high levels. This growing imbalance may affect the program's capacity to maintain the quality of instruction, mentoring, and student support. Strategic planning will be important to ensure the program can adapt to these evolving demands.
2. The department has one faculty graduate advisor serving approximately 300 students per semester. External reviewers expressed concern about this workload. Starting in Fall 2023, all advising responsibilities will be shifted to a dedicated staff member. However, some level of faculty involvement in graduate student advising will remain necessary.
3. The current admission decisions were being made primarily by the graduate advisor, rather than leveraging the expertise and diverse perspectives of an admissions committee to ensure a fair and comprehensive evaluation of applicants.
4. The MSCS program currently lacks a clearly defined timeline for when students should take the comprehensive examination. External reviewers have recommended setting a minimum number of completed units as a prerequisite for exam eligibility.
5. Computational resources appear to be insufficient for certain classes that require processing large datasets. Some of the coursework could benefit from access to more powerful computing resources, such as GPUs.

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Opportunities for Development were noted in the reports:

1. Although the program measures student learning, it currently does not engage in program-level evaluation. The department plans to initiate indirect assessment through graduate and employer surveys in 2023. It is recommended that the department establish a framework for conducting annual assessments to evaluate the program's strengths and identify areas for improvement. This framework should include both direct and indirect assessment methods, a schedule for regular data collection and analysis, and clear processes for using the results to inform continuous program improvement.
2. The MSCS program has experienced a significant surge in applications over the past few years. In Fall 2022, the program received a record-breaking 3,400 applications, a dramatic increase from 804 in Fall 2019. While the Department expanded enrollment from 108 students in Fall 2020 to 223 in Spring 2022, capacity constraints have recently necessitated limits on new admissions. As graduate course enrollments have grown from 35 students per course to 70 or even 105. The increased demand for course sections has impacted the Department's ability to effectively support its undergraduate (BS) programs. To address this growth while maintaining program quality, the Department may consider expanding enrollments by offering a supplemental program through the College of Professional and Continuing Education (CPaCE).
3. The graduate student population in the MSCS program is predominantly international, with the vast majority of students coming from Asia. In a typical semester, international applications outnumber domestic applications by as much as 30 to 1, while representation from other ethnic groups remains relatively low. Notably, the graduation rate for Hispanic/Latino students from the Fall 2019 cohort is comparatively low. In response, the Department is actively working to increase diversity and improve access for students from historically marginalized groups. As part of these efforts, the GRE requirement was removed beginning in Spring 2023, and the minimum GPA requirement for admission was revised to 2.7. The Department is also exploring targeted outreach opportunities, including promoting the program at Historically Black Colleges and Universities (HBCUs) and in other regions with underrepresented minority populations.
4. Only a small number of students currently opt for the thesis as their culminating activity. To encourage greater student participation in research, the program could consider introducing projects as one of the options for satisfying culminating activity requirements. This could offer more flexibility while still promoting research engagement and critical thinking.

Recommendations:

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It is therefore agreed that the Department of Computer Engineering and Computer Science will collaborate with the College of Engineering and Division of Academic Affairs to:

1. Create and implement a programmatic assessment plan in order to complete annual assessments using direct and indirect methods and report on closing the loop activities to illustrate that continuous learning outcome data are used to inform decision making. Provide an annual update (due June 1) on progress made towards MOU actions to the dean of College of Engineering, the Vice Provost for Academic Programs, and the Coordinators of Program Review and Assessment. Your review cycle will be from 2022-2029. A comprehensive self-study will be due June 2029 for a 2029-2030 Academic Year review process. *(Opportunity #1)*
2. Determine opportunities for growth, evaluate feasibility, and explore strategies to manage the increasing demand for the MSCS program by developing a supplemental program through the College of Professional and Continuing Education (CPaCE). *(Opportunity #2)*
3. Develop and implement a strategic diversity recruitment plan aimed at increasing domestic enrollment and improving representation of historically marginalized groups in the MSCS program. *(Opportunity #3)*
4. Consider introducing a project option in addition to the thesis option for the culminating activity requirement. Additionally, review and adjust the WTUs to ensure equitable faculty compensation for supervising thesis and project options. *(Opportunity #4)*
5. Engage in strategic planning to address the growing student-to-faculty ratio by evaluating long-term faculty hiring needs, considering adjustments to instructional capacity, and exploring alternative instructional models. *(Concern #1)*
6. Establish a graduate admissions committee to support the graduate advisor and enhance the admissions process by incorporating broader faculty input and diverse perspectives in evaluating applicants. *(Concern #2 &3)*
7. Establish and implement a clear policy specifying the minimum number of completed units required before students are eligible to take the comprehensive examination. *(Concern #4)*
8. Determine the financial feasibility of offering a high-power computing lab for student access. *(Concern #5)*

This MOU has been read and approved by:

Associate Dean for the College of Engineering on behalf of Department of Computer Engineering and Computer Science: Kerop Janoyan
Dean for the College of Engineering: Jinny Rhee
Interim Vice Provost for Academic Programs: Pei-Fang Hung
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