

External Review Report – MS Computer Science California State Polytechnic University, Pomona

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The purpose of this external review of the MSCS (Master of Science in Computer Science) program is to provide an unbiased examination of the quality of education and service in the program and to identify opportunities for improvement and growth. After carefully reviewing the program's Self Study, we took part in a virtual campus visit on April 21, 2022, followed by a campus visit on April 27, 2022. We met with Alison Baski, Dean of the College of Science; with Daisy Tang, Chair of the Computer Science Department; with students in the program; with department faculty and adjunct faculty. This report is divided into sections on strengths, challenges, and recommendations.

Strengths

- The MSCS curriculum is well-designed, reflecting modern technologies and providing students with rich research opportunities via thesis and project options. Also, the program has the appropriate balance between courses taught by tenure/tenure track faculty vs. adjunct lectures/part-time faculty. As for the MSCS program, the majority of courses are taught by tenure-line faculty. Students are provided sufficient experiences with equipment and technologies that will prepare them for success after graduation. The department achieves it through adequate class size, hands-on oriented courses, and close faculty-student working relationships. Most graduate class sizes are manageable (around 30). Most classes are very hands-on. Faculty are working with students very closely.
- The department faculty are highly motivated for teaching and research, seeking ways to improve the curriculum at both course and program levels and actively bringing in external research funds. Also, the program has a faculty body composed of diverse experts to teach all the necessary areas within the curriculum. Several faculty are very active in bringing grants to support students' co-curricular experiences.
- The department has a collegial working environment under the strong leadership and guidance of the department chair. The department chair and the faculty group expressed mutual support and respect while exchanging their opinions.
- The program admitted and enrolled students who are well-suited for success. The admission is highly selective. The admission criteria are rigid. Admission rates are around 30% and only 30% of the admitted students are enrolled. Overall the program has maintained consistent and stable enrollment rate (60~90 students) year to year. Students we met are satisfied with the curriculum and faculty engagement in co-curricular experiences. Students in the meeting were perceived to be highly motivated and appreciated for extra opportunities, such as scholarships and internships, given to them. Several students mentioned that they were introduced to internships/scholarships by faculty and those opportunities led to their thesis/project.
- The department has dedicated staff members – the IT staff and the department coordinator. Their comments reflected a strong work ethic and high satisfaction with their job and the department.
- The department has a dedicated graduate coordinator who carries a high volume of responsibility.
- The university/college/department provides tenure-line faculty adequate support for teaching and research, including s-factor for thesis/project supervision and internal grant.

- The college dean is supportive of the department. She recognizes continuous growth of the department and plans to support recruiting more faculty and allocating research spaces for the department.

Challenges (Threats and Weaknesses)


- Per ABET, program educational objectives (PEOs) are the broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve. The presented PEOs are not broad. They include specific job titles. We recommend to revise the PEOs (in particular PEO #1).
- PEOs and SLO are not aligned with the University/College's mission, vision, and values. We suggest PEOs or SLO include social, environmental, and ethical responsibility to better align with the Univ/college mission, vision, and values at a broader level.
- Also, the department is encouraged to check the mapping between SLOs and Strategic Vision in Table 5. It is unclear how SLO 5 is aligned with Civic Engagement.

Recommendations (Opportunities)

- We recommend the self-study report to include more data. Student profile didn't include % of international students. Breakdowns only by URM, Gender, and 1st generation were presented. The program did not address equity gaps. The analysis of the equity gaps was not presented. It would be good if the department performed graduation/retention/performance equity gap analyses based on a variety of breakdowns (e.g., gender, URM, and prerequisites)
- The curricula offer the necessary depth and breadth of study, sensible flow and sequencing of courses, and ample culminating opportunities for students to demonstrate the achievement of SLOs. The program offers a wide range of elective courses for the breadth of computing disciplines. Students have culminating experiences through a year-long project/thesis course. However, we recommend for the department to consider offering concentrations to provide depth of study in specific computing areas, such as cybersecurity.
- We recommend the department to ensure to specify student learning outcomes (SLOs) in the syllabi of all the core MSCS courses.
- As the department is growing in terms of student enrollments, we recommend the college consider providing grader support for mid-size classes (50-70) to better support faculty for teaching.
- To better deal with the fast-changing educational environment, the department is encouraged to open a discussion about offering classes in various instructional modes such as virtual, asynchronous, or hybrid as well as in-person for both BSCS program and MSCS program.
- We recommend providing roadmaps for the graduate students on the department webpage.
- Several faculty expressed the need for more research spaces. Currently, many faculty share the research labs, often creating scheduling challenges for research meetings. There is not enough space for accommodating equipment sponsored by grants. We recommend the college to survey available spaces in the building and consider allocating more research spaces for the department.
- Several students expressed having a limited selection of elective courses (once every 2 years) and requested to increase the frequency of the course offerings. We recommend the department to look into this.

- Several people, including the department chair, faculty, and the department coordinator, mentioned overwhelming workload for the department coordinator. We recommend hiring a dedicated assistant to the department immediately upon availability of hires. In the meantime, we recommend the department to seek
 - Utilization of grad student assistants or mentors with proper training
 - Workflow improvement that can reduce the existing workload for student advising (e.g., permit issues for unconditional grad students)
- The graduate coordinator is perceived to carry a multitude of work that might cause burnout or bottleneck. Thus, we recommend the department to consider
 - Forming an MSCS admission committee/taskforce and assigning admission reviews to the committee/taskforce
 - Identifying one more faculty and distributing the coordinator workload (e.g., advising provisionally admitted students vs. pre-admission students).

Sincerely,

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Eun-Young Elaine Kang

May 18, 2022

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Christopher Ryu

May 18, 2020