

## **Program Performance Review: Culmination Meeting Memo Civil Engineering BS; Computer Engineering BS; Computer Science BS; Electrical Engineering BS; Mechanical Engineering BS**

The 2019-2020 Program Performance Review (PPR) process for the BS programs in the College of Engineering and Computer Science (ECS) – Civil Engineering, Computer Engineering, Computer Science, Electrical Engineering, and Mechanical Engineering – concluded with a culmination meeting on November 9, 2021. These BS programs are accredited by the Accreditation Board for Engineering and Technology (ABET). The Computer Science, BS program submitted Computing Accreditation Commission (CAC) of ABET accreditation documents in lieu of program review documents; The other BS programs submitted Engineering Accreditation Commission (EAC) of ABET accreditation documents in lieu of program review documents.

The following people attended the meeting: Carolyn Thomas (Provost), Mark Filowitz (AVP for Academic Programs and Enrollment, AVPAPE), Susamma Barua (Dean, ECS), Sang June Oh (Associate Dean, ECS), Phoolendra Mishra (Department Chair, Civil Engineering), Kiran George (Department Chair, Computer Engineering), Chang-Hyun Jo (Department Chair, Computer Science), Jidong Huang (Department Chair, Electrical Engineering), Chean Chin Ngo, (Department Chair, Mechanical Engineering), and Su Swarat (AVP for Institutional Effectiveness, AVPIE).

The Provost congratulated the programs for successfully completing the accreditation cycle, with the outcome of receiving full reaccreditation for all programs. The Provost commended the programs in areas of advising, faculty recruitment and retention, and research grant generation. The AVPAPE also commended the programs for their industry collaboration, and intentional effort to increase women in engineering. The following specific accomplishments were highlighted during the reaccreditation process:

- The College has used its funding to create an initiative, “Big Ideas”, to encourage faculty to submit ideas for funding that supports their projects intended to bridge engineering with social impact in the local community, which in turn provides faculty development opportunities, enhances student learning and engagement, and produces community impact.
- The College consistently ranks in the top nationally for bachelor’s degrees awarded to Hispanics, which speaks to its commitment to serve underrepresented populations and diversify the national engineering workforce.
- The Civil Engineering program has close interactions with local engineering firms, whose members actively participate and advise on evaluation and modification of program educational objectives, teaching, curricular offerings, bi-annual capstone showcase events, and offer paid student internships. This involvement has led to job placements for many graduates.
- Even with increasing student enrollment since last review, Computer Science program offers adequate student advising about the curriculum, degree completion and careers.
- The Electrical Machinery Lab’s use of a color-coded labeling system to keep track of the power ranges of the equipment identifies differences between regular and three-phase power, which significantly enhances safety measures in the lab.

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Major recommendations and issues raised through the accreditation process were discussed as follows:

1. Space constrains:

- The Dean reported that the biggest challenge for the college is space. Despite creative solutions to maximize the usage of current space (e.g. offering labs courses in the summer, swapping students in/out of the lab when they are not actively using the machines/equipment, faculty sharing research space), strategic vision, corporate partner collaboration, and faculty recruitment efforts are often limited by the lack of space. This echoes the ABET recommendation for greater project space for students and research space for faculty.
- The Computer Science Chair concurred that space is a challenge for the department. The department does not have any space for new faculty.
- The Civil Engineering Chair also reported space issues. Specifically, the limited lab space and availability, coupled with limited number of technicians, make it challenging to meet the curricular demand for labs. Additionally, the department struggles to provide office space to new faculty, limiting faculty recruitment effort.
- The Mechanical Engineering Chair stated that the faculty are collegial, and are willing to share research space to resolve the space issue. However, the need for more space remains. The department has lost excellent faculty candidates due to lab space. The program has tried to mitigate this issue by hiring faculty with computational background in the past few years, but the students need faculty who can provide hands-on experience (hence the need for more lab space).

2. Student enrollment:

- The Dean stated that there is a strong need to balance the high demand for Computer Science with enrollment in other ECS BS programs.
- The Computer Science Chair echoed the high demand for Computer Science. The program is offering Saturday classes to meet the demand.
- The Electrical Engineering Chair reported that the department is experiencing enrollment decline in both undergraduate and graduate programs, and needs help from the college and university to stabilize enrollment. The department recognizes the need to modernize the curriculum, and needs support to help faculty develop expertise in this area.
- The Computer Engineering Chair stated that its undergraduate program enrollment is stable and manageable, but the graduate program enrollment is declining. Similar to Electrical Engineering, the department understands the need to update the curriculum frequently, and the faculty are supportive in this effort.
- The Civil Engineering Chair reported healthy undergraduate program enrollment, but declining graduate program enrollment.

3. Faculty research support:

- ABET recommended faculty growth, particularly for Civil Engineering and Mechanical Engineering programs, to strengthen and enrich student experiences.

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- The Computer Engineering and the Civil Engineering Chairs both stated that junior faculty could use more support for research. Currently, faculty only receive reduced course load for the first two years. It would be helpful to extend to 3<sup>rd</sup> and 4<sup>th</sup> year.
- The Dean commented that the college has not been able to hire a Research Grant Specialist for 1.5 years due to unsuccessful recruitment. The Provost will follow up with the Dean on this issue.

4. Staff needs:

- The Computer Science Chair reported that there is not adequate staff to support the needs of students and faculty. Limited staff availability and capacity, coupled with challenges associated with university processes (e.g. CHRS), make it difficult to streamline the hiring of adjunct faculty, grader, tutor, and student assistants.

The Provost concluded the meeting by thanking the Chairs for “managing in the middle”, thanking the Dean for leading all the work, and voicing commitment of university support to help ECS move toward the right student enrollment balance, right faculty composition, and right space and facilities. The Dean acknowledged the hard work of the Associate Dean, and thanked the Provost for institutional support.