July 3, 2018

**PROFESSOR DEAN TULLSEN, Chair**
**Department of Computer Science and Engineering**

**PROFESSOR CHRISTINE ALVARADO**
**Department of Computer Science and Engineering**

SUBJECT:     Undergraduate Program Review for the Department of Computer Science and Engineering

Dear Professors Tullsen and Alvarado,

The Undergraduate Council discussed the Department of Computer Science and Engineering's 2018 Undergraduate Program Review. The Council supports the findings and recommendations of the review subcommittee and appreciates the thoughtful and proactive response from the Department.

The Council would like to highlight the need for faculty advising. We feel that students would benefit from the experience of meeting with, and receiving career and industry guidance from, faculty. If one-on-one advising is not possible due to the large student population, the Department could identify areas of specialization for faculty, and students could meet with the faculty in a group setting.

The Council will conduct its follow-up review of the Department in Spring 2019. At that time, our goal is to learn about the Department's progress in implementing the recommendations of the program review subcommittee and the Undergraduate Council. We are particularly interested in learning about the results of the changes to prerequisites, and the success of the lottery system in the capped major application process. The Council extends its thanks to the Department for their engagement in this process and we look forward to the continued discussion.

Sincerely,

Sam Rickless, Chair
Undergraduate Council

Attachment
 (1) Undergraduate Program Review Report and Responses for Computer Science and Engineering

cc:     F. Ackerman
        J. Eggers
        R. Horwitz
        J. Moore
        A. Pisano
        R. Rodriguez
        M. Sidney

**Undergraduate Program Review**
Department of Computer Science and Engineering

The department should be commended for an excellent comprehensive self study. The picture we obtained from our day and a half of meetings was consistent with what was presented in the self study. Although enrollment growth appears to be under control, there is still a sense of being burdened by a very large workload from both majors and non-majors. The department has an excellent plan in place but the plan will need to be monitored carefully, particularly in regard to its impact on diversity. There is also some concern that senate faculty growth is not increasing at a rate commensurate with the number of majors and that a disproportionate proportion of the teaching is being carried out by non-senate lecturers.

A. Strengths and weaknesses of the current operation of the department

Strengths:
- The department has a great advising staff who really care about the students (including OSD students and students from diverse backgrounds).
- They mounted an excellent response to the skyrocketing demand for both CS majors and CS courses enrollments for non-majors. This has been a difficult time for CS departments across the nation, and the CSE department should be commended for their timely and thoughtful response to this challenge.
- There is a general feeling in the department of having achieved "steady state" on enrollment numbers.
- There appears to be generally good rapport between CSE and ECE.  At least one faculty member commented that it didn't really matter where a candidate was hired.
- Graduate TA training (CSE 599) is excellent and highly rated by those who have gone through it.
- The mixed labs (tutors/TAs from several classes in same space at same time) is making excellent use of lab space and also providing students excellent flexibility in getting help when they need it.
- There generally seems to be satisfaction with the number of tutors/TAs for classes, although much of that seems to be funded with department discretionary funds rather than centrally.
- Students feel that there is a good community and collaborative environment

Weaknesses:
- The department continues to have difficulty hiring a diverse faculty and admitting and retaining a diverse student body.  Often faculty vote on a candidate they have never seen, and one or two negative comments can disproportionately sway an argument, conferring a sort of veto power by one or two faculty members. [See the attached slides provided by a CSE faculty member to see the extent of the problem.]

- FTEs and resources from the Division (except for TA funding) are being determined by the number of majors and not the actual number of students taught (which is much higher due to the large number of non-majors in the courses).
- A possibly disproportionate number of courses (and students) are being taught by Unit 18 faculty (non-senate teaching faculty) and faculty are concerned that this is not being transparently reported.
- There is also some concern that many courses taught by temporary staff.
- Some faculty still feel overworked with no energy/time for being innovative with regard to teaching and curriculum.
- The major diversity efforts tend to fall to the same small set of faculty, who are often themselves from those diversity target populations, putting undue stress on them.
- The department needs better access to admissions/enrollment data including analyst support to explore diversity, retention, graduation rates, etc.
- There is poor campus support for the department to communicate electronically and via US mail with admitted but not yet matriculated students as part of yield and advising efforts.
- It appears students can get to their senior year without ever meeting with a staff advisor or even having a plan on how they plan to graduate on time.
- More support is needed from the University for accommodating OSD students.
- Better faculty education is needed on issues of implicit bias, cultural differences, and appreciation of differences.
- The few discrepancies in the CE/BS between ECE and CSE are problematic. It seems plausible that one reason more CE students choose CSE is because of the D rule (D's are considered passing grades in CSE but not ECE). Consider dropping or appropriately amending the D rule in CSE.
- We were informed that the department's FTE allocation is primarily driven by majors and not by enrollments, leaving no real funding stream for large non-major lower division courses
- There is a shortage of faculty office space with no obvious sub-group to move to a new building.
- There is a perceived lack of campus support for exploring/moving-to new teaching modalities: hybrid, flipped, full-online.
- Despite the perception of moving to steady state, there are still many concerns about high workload and over-enrollment.
- There appear to be wide differences in teaching commitment and quality (which seems to be more than in other Departments - students complained especially about faculty using online lectures from another faculty member).
- More undergraduate tutor training is needed. CSE 99 is viewed as insufficient especially for the tutors who are leading sections (functioning as TAs). 599 is perceived as being much more effective.
- There appears to be no official role of faculty in advising. (Advising appears to be handled entirely by the advising staff.)

- There is wide variation in the hiring process for tutors. Care needs to be taken to avoid making verbal commitments by faculty that cannot be completed. What is the tutor hiring process?
- International students coming in via CCC do not need to take TOEFL and thus may end up at UCSD with deficiencies in English.

B. Strengths and weaknesses of the curriculum

Strengths:

- Students feel that the Department does a good job of helping the struggling students (with large numbers of tutors in entry-level classes).
- The curriculum was recently restructured into four areas that allow more flexibility in meeting major and minor requirements.
- Students approve of the decision to not allow concurrent enrollment in CSE 100 and CSE 110 in the same quarter.

Weaknesses:
- Students feel that stars are not allowed to thrive and challenge courses they have already mastered (e.g. a student with USA Computing Olympiad experience is still required to take some initial programming course.) Consider making it easier for students to test-out or petition for exemption, especially in LD courses. Weaker students also find it intimidating to have these over-prepared students in the courses. Maybe a possible solution here would be to provide a "final exam" only enrollment option.
- There is concern among students about a wide disparity in effort and quality of teaching
- There is a general disdain among students for CSE 103.
- Students feel courses in databases and web development are missing or inadequately represented in the curriculum.
- The prerequisite structure is inflexible and, in some cases, inappropriate.
- Apparently, graduate courses are being used to let students take courses without prerequisites because of the lack of prerequisite flexibility in the undergraduate program.
- The BA degree needs to be revisited - particularly given it now has more units than the BS degree.
- Some in the department feel that the curriculum reform did not go far enough.

C. Department in the context of campus and University policies

- There was some discussion among faculty that CSE does not really fit in Engineering and may be better served as its own school or division: (1) CSE is not receiving resources for lab courses though they need them for programming resources, (2) CSE is

more of a service department (with many non-majors served) than the other Engineering Departments.

● The department will begin an admission lottery system this spring, admitting 75 students from the continuing pool of students who have completed entrance criteria.  Without any data yet, there are mixed views about this.

● There is a lack of reward/credit for outreach activities (both at department and campus level).

D. Recommendations

1. Find a mechanism to allow for TAs to be given course duties prior to the start of the quarter to help with course preparation.
2. Make every effort to make sure that qualified students are allowed to test out of courses. This is particularly important for lower division courses where such students can create an intimidating classroom environment for students that come into the class with the normal preparation, with a negative impact on retention.
3. Re-examine the prerequisite structure and eliminate any artificial prerequisites.
4. There should be university-wide space and staff to deal equitably and consistently with students with disabilities, specifically for testing accommodations.
5. Consider moving Warren college to one of the new buildings to free up more space for student labs and new faculty.
6. The CSE department should not be expected to provide temporary academic staffing funds to cover their large enrollments, particularly for courses with large non-major enrollments. It is our understanding there is a funding formula but it appears to be woefully inadequate.
7. With all the construction, consider including large lecture halls so that faculty teaching large classes do not have to give the same lecture to separate sections.
8. The Department and Division should provide leadership on better appreciating diversity and recognizing implicit biases in hiring, admissions, and retention.
9. The Department and Division should provide support for outreach efforts (possibly in the form of teaching relief, recognition during promotions, etc.).
10. The Department should consider standardization of tutoring hiring/vetting process
11. The Department should consider removing D as a passing grade for any of its majors and minors.

Other thoughts/questions:

What percentage of students come from San Diego county and how might this influence outreach and the hope of it having an impact?

There is a perception that transfer students are not doing as well as native juniors. Is that the case? What does the data say? Can/should the transfer requirements be raised (or should there be a "bootcamp/transfer intro" course to align expectations)?
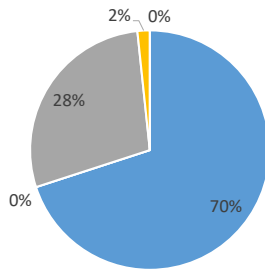
**California population in 2016**

6.5%   1.5%
15%
38%
39%
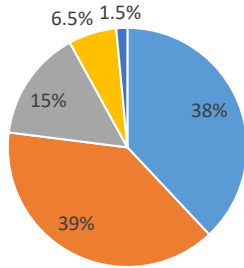
**UCSD undergraduates in 2016 (residents)**

2%   8%
19%
34%
15%
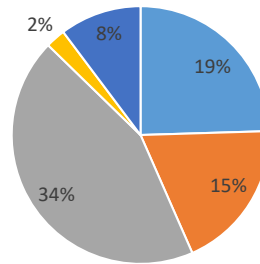
■ White   ■ Latino   ■ Asian Am.   ■ African Am   ■ Other

**CSE faculty 2017**

2%   0%
28%
0%   70%

**CSE undergrads in 2015 (residents)**

1%   7%
21%
9%
62%
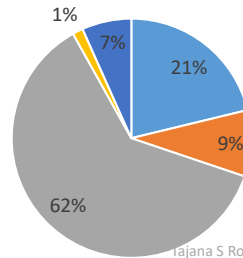
Tajana S Rosing, CSE; March 2018