ELECTRICAL & COMPUTER ENGINEERING
UNIVERSITY of WASHINGTON

Professor Eric Klavins
Electrical & Computer Engineering
University of Washington
Campus Box 352500
Seattle, WA 98195-2500

Feb 2, 2024

Department of Academic Affairs
Graduate School
University of Washington
307 Loew Hall

Dear Department of Academic Affairs,

Thank you for sharing the comments from the external review committee regarding the Ten-Year Review of the Electrical and Computer Engineering (ECE) department in December of 2023. This letter describes ECE's response to the comments. It was prepared over the last several weeks by Eric Klavins (professor and chair) through conversations with our Ten-Year Review Committee consisting of Lih Lin (professor), Daniel Kirschen (professor), Matt Reynolds (professor), and Aleesha Wiest (administrator) and only after sharing the reviewer comments with stakeholders and soliciting their feedback.

We are gratified that the review committee described in detail several strengths, including the department's leadership, our research program, our degree programs, collegiality, mentorship for assistant professors, DEI, and our capstone program. The committee also highlighted the positive progress the ECE Department has made since its last review, including changing the department name, forming an advisory board, revising our undergraduate curriculum, and guaranteeing funding to our PhD students. Indeed, these observations support our own estimation that the ECE Department is flourishing with increased interest from students, robust research funding, growth in faculty, a strong sense of community, an improved national ranking, and strong alignment with national funding priorities.

The review committee did describe three areas of concern, which we address next.

Resources: The review committee correctly identified the most significant source of strain on our department, which is the availability of resources to support our growth. As our report describes, we have experienced a 60% increase in enrollment in our undergraduate degree, the rapid growth of our Professional Masters Program (PMP), and a greatly expanded role leading center-level activities across campus. At the same time, many crucial resources have not kept pace. In particular, the committee noted three specific areas where resources are needed.

First, ECE does not have sufficient instructional or research space. We agree completely. Although the new building being constructed in the College of Engineering may help with instructional space, research

space, especially to support large experimental efforts, remains extremely scarce. Significant building renovations could help. A space study, included in our report, showed substantial, relatively low cost, opportunities to increase usable space in our building, which we believe the university should pursue. We also strongly support an engineering program fee, which could help ECE improve the currently stressed instructional resources available to our students.

Second, the committee commented that the size of our faculty and staff has not kept pace with the size of our student body. We agree here as well. We do have modest funding to support additional staff and faculty positions, enabling us to return to slightly more than pre-pandemic levels. Longer term, we believe that appropriate next steps are to (1) explore revenue generating programs such as an expanded PMP program and industry partnerships; (2) engage in a strategic planning process (recommended by our reviewers) that involves the college, the university, industry partners and state leadership to make the case for more substantial investment in ECE to support its unprecedented growth.

Third, the committee noted that the department does not have enough PhD and Postdoctoral fellowships to support a prominent program such as ours. We agree with this assessment as well. Recruiting PhD students and postdocs to support our expanding research program is one of our greatest challenges, especially with the high cost of living in the Seattle area. We believe a concerted effort should be made to (1) identify donors, (2) industry partners and (3) federal function (e.g., training grants) to substantially increase government funding for PhDs and Postdocs.

Industry Programs: The committee correctly observed that UW ECE industry programs, while strong, are not as substantial as at our aspirational programs across the country, such as UC Berkeley, Georgia Tech, UCSD, U. Michigan, UT Austin, and others. Our own assessment is that we are often unable to respond to opportunities mainly due to short staffing within the department and at the college level. Our immediate plan is to develop a model to sustain a new position within the department that would be focused on student facing-industry programs such as recruiting events, community building, career mentorship, and other low hanging fruit. We are also in conversations with the College of Engineering to increase staffing in their Corporate and Foundation Relations team through a shared position. Longer term, we would like to see industry partners with offices in our building, more umbrella agreements like the Amazon HUB, and considerably more industry sponsored research.

The committee also pointed out that we could be using our external advisory board (EAB) better, and that we could imagine restructuring it to be more focused on alumni relationships, fundraising, and public relations. We agree with this assessment as well. Fortunately, the timing of our upcoming advisory board meeting in May of 2024 coincides with several three-year terms ending. Based on the committee's feedback, we are planning to have these subjects be the focus of our 2024 EAB meeting, in collaboration with the college's Advancement team.

Student Related Issues: The committee expressed concerns about the size of our PhD program and in particular our method of collaborating with our faculty to guarantee their funding. Some ambiguity in how this process works may have resulted in a slight decline in the size of our PhD program over the last five years, with several large experimental labs preferring postdoctoral scholars. However, in 2023 we did admit a considerably larger cohort of PhD students than in previous years after a concerted effort to refine our process. We will continue to monitor this closely.

The committee also recommended several ways to improve the PhD experience including improved mentorship, student led events, research talks, and general community building. We completely agree and are actively exploring ways to accomplish these goals. For example, last spring we piloted a course called "Hacking the PhD", which explores everything from developing a good research question to leading a quiz section. Our graduate curriculum committee is discussing whether and how to make this course mandatory for first year students. The committee is exploring several related directions as well.

With respect to our undergraduate program, the committee heard from students that the current career fair model, run by the college of engineering, is not working for them. We have heard similar concerns. In conversations with the big companies that hire our students, we have also heard that companies do not think that such career fairs are useful either, given the preponderance of online recruiting tools. Rather, companies prefer focused recruiting events in which they bring 5-10 working engineers to campus for an all-day event. We successfully held such an event just last fall with Apple and will host Tesla next month. Going forward, we are exploring sustainable funding (e.g., through industry contributions) of a new staff position to manage these industry events on a regular basis.

The committee noted we could improve our recruiting process for PhD students as well as their experience outside of their labs. We plan to continue to work with faculty to improve our recruiting process. To build community, we will explore PhD lunches, research presentations, affinity groups, and other avenues. To ensure these efforts are sustained, we believe the specific duties of the graduate program coordinator (GPC) should be revised, or that a new position with these goals in mind is created.

Recommendations

The committee offered several key recommendations. Our responses to a few of them are interspersed with the above discussion of concerns. Below, we discuss the committee's main recommendations. The miscellaneous suggestions at the end of their comments are all perfectly reasonable and aligned with our general continuous improvement as a department.

Strategic planning: The committee noted that ECE has much to gain by leveraging the high demand for its degree programs and the incredible opportunities afforded by the $50B CHIPS and Science Act. They also correctly pointed out, however, that a strategy is required that builds on our regional strength. Specifically, the Pacific Northwest does not have a large industrial presence in the semiconductor industry. However, ECE, UW and the region do have a strong presence in AI/ML, Photonics, Neurotechnology, Quantum Information, and Medicine, all of which involve ECE technologies at a fundamental level. As the committee suggests, a strategic planning process, or perhaps more aptly called a market analysis, should be pursued focused on how ECE and UW can catalyze investment in these areas across the region, and how the region can benefit from the CHIPS and Science Act along these verticals.

Degree Programs: The committee noted that our undergrad and professional masters degree programs have seen large increases in enrollment, while our daytime masters program has seen large fluctuations, and our PhD program has shrunk somewhat. These large changes have strained the department considerably, especially in terms of space, teaching capacity, advising, capstone programs, and student

mental health. The committee suggested a strategic planning process focused on our vision for each of these programs. We agree, and believe the best path forward is to collaborate closely with the college to make sure these programs are stable, sustainable, and appropriately funded.

Research Growth: The committee suggested we engage in a strategic planning process for faculty hiring and research directions. Although we could always improve, we disagree with the committee that a full-blown strategic planning process is required or that a course correction is necessary. We feel we understand quite well the value proposition of ECE's research program. We have clear international strengths in Devices, Quantum, Neurotechnology, Power Systems. We have supported our faculty to make enormous impacts on their fields as evidenced by our publications, funding, student placements, and overall stature. We have leadership roles in centers across campus. We have solid fundamentals in circuits, signal processing, robotics, and machine learning. Furthermore, we have in place a robust hiring strategy, as described in our Self Study, and we have implemented a hiring process that incorporates best practices in DEI and recruiting in general that is the envy of departments across the country. If anything, the department should do a better job of conveying our strengths, which could be a part of the planning process for catalyzing investment in ECE.

Conclusion

Once again, we would like to thank the committee and the Graduate School for engaging so thoughtfully with our department. The process was extremely healthy for our stakeholders, and the committee did a remarkable job identifying our key pain points in a short period of time. As described above, we agree with almost every observation they made and greatly appreciate the outside perspective on our department.

Sincerely,

Eric Klavins
Professor and Chair