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To: Lee Huntsman
Provost

From: Marsha Landolt
Dean and Vice Provost

Re: Department of Electrical Engineering Review

Summary and recommended action

At its meeting of May 15, 2002, the Graduate School Council met with the Department of Electrical Engineering review committee, the Department Chair and the Dean of the College of Engineering. The Council commended the Department for its dramatic progress since its last decennial review. While the Department faces critical challenges, it is rapidly approaching the top ranks of electrical engineering programs in the U.S. It has hired outstandingly well, has made some important strategic choices regarding focus and investment and is addressing the very complex issue of developing a more cohesive departmental culture. It is strengthening interactions with other units across campus and can be expected to become an increasingly important University asset.

The Council recommended continuation of all degree programs in the Department, with its next review in 10 years (2011). I heartily endorse the review committee's and Council's comments and recommendations.

Background

The Department of Electrical Engineering currently has approximately 545 majors in its ABET-accredited Bachelor of Science program. It has 295 students in its Master of Science and Ph.D. programs. About 170 BS, 70 MS and 20 PhD degrees are awarded annually. Students are instructed by a core faculty of 41 (35 men, 6 women). In addition, the Department has 14 research professors, 5 lecturers, 14 postdoctoral research associates, and 63 adjunct and affiliate professors. The faculty has enjoyed growing national recognition, especially in the past several years: 10 NSF CAREER Awards and 8 NSF Presidential Young Investigator Awards. The Department research awards are increasing at an extraordinary rate. Externally funded research grew from $5.0 million during the 1998-1999 fiscal year to $12.6 million during the 2000-2001 fiscal

year, and in the first six months of the current 2001-2002 fiscal year, the Department has been awarded over $14.4 million in grants and contracts.

The Department clearly has made revolutionary progress over the decade since the last (1988) review. The current chair, Howard Chizeck, was recruited to the Department in July 1998 with the mandate to lead the program to national prominence. Since his arrival, the Department has hired 15 new faculty members, nine of whom have received NSF Early Career Development awards. The number of Ph.D. degrees granted has doubled and continues to rise; fundraising efforts have allowed for the rebuilding of computing infrastructure and educational laboratories. Both he and the Department are to be congratulated for this very impressive progress.

While fully appreciating the distance the Department has traveled, the 2001 review committee noted a number of areas in need of attention. The Department has rapidly moved to address each of them. One of the most critical is that the Department had been supporting an undergraduate major enrollment that simply outstripped its budget allocation. This very substantial gap has been addressed (with University consent) by decreasing admission to achieve a target enrollment of 428, the last level authorized by the University (in 1992). They are addressing other issues within the major as well, including: (a) improving the timing and staffing of course offerings, (b) requesting the institution of lab fees to partially cover costs, (c) strengthening TA training for undergraduate laboratories, and (d) appointing an Undergraduate Research Coordinator. Several suggestions were made for the graduate program were made as well. Again, the Department has responded constructively to each.

The greatest remaining challenge resides in what the review team identified as a critical need to develop more of a sense of "department" as opposed to an agglomeration of independent labs. Specific suggestions included (a) development of a department-wide colloquium, (b) adoption of a uniform process for hiring and evaluating research faculty and (c) reconsideration of the role of research faculty within the Department, (d) taking measures to encourage graduate students to identify more with the department rather than individual labs, and (e) organizing a more uniform process for mentoring new faculty. In addition, it was suggested that Departmental climate and research infrastructure could be improved significantly by initiating a computer recharge center to cover research computing costs, rethinking the way RCR money is apportioned (retaining more centrally) and increasing the price of course buyout from research direct costs. The Department has responded to each of these suggestions and is already implementing changes.

The Department has attempted to articulate its research mission and promote multi-investigator initiatives by defining research foci in well defined areas of existing strength and funding opportunity. In some areas this has worked well (*e.g.*, Genomics, Proteomics and Health Care Diagnostics) while others (*e.g.*, Complex Networks) are poorly defined and difficult to grasp. The Department fully appreciates the value of strategic planning and the need to identify just where it expects to make its major research contributions. It also recognizes that not all research must align with the foci that will eventually be defined. The Department understands that it is essential that it become preeminent in one or more areas to achieve its goal of becoming one of the best Electrical Engineering Departments nationally. It shows all signs of commitment to the goal and is in better condition than it ever has been to collectively choose its future.

The overall impression clearly is of a rapidly improving Department continuing to address issues in a manner that has proved to be successful over the last several years. It has made constructive use of this review. The Department is developing crucial research partnerships, such as its participation in the interdisciplinary photonics research effort, and is incorporating them into its vision of its future. The Graduate School Council

sees the Department as being on a trajectory to become a University-wide force. As this occurs and as the University emerges from the current financial crisis, it will be important to recognize the growing disparity between faculty salaries in this Department and those of peers (not to mention the national leaders). This disparity makes the Department increasingly vulnerable to other institutions looking for outstanding recruitment opportunities. While adoption of a "B" salary component might offer some short-term relief, the competitive problem is likely to be resolved only through adjusting the base.

c: Richard McCormick, President
Denise Denton, Dean, College of Engineering
Debra Friedman, Associate Provost for Academic Planning
John Slattery, Associate Dean for Academic Programs
Howard J. Chizeck, Chair, Department of Electrical Engineering
Members of the Review Committee: Werner Stuetzle, Department of Statistics (Chair); Marcia Baker, Atmospheric Sciences and Earth and Space Sciences; David Notkin, Computer Science and Engineering; Kent Fuchs, School of Electrical and Computer Engineering, Purdue University; Alan Laub, Department of Computer Science, UC Davis; Theresa Meng, Department of Electrical Engineering, Stanford University.
Graduate School Council
Augustine McCaffery, Assistant to the Dean
Heidi Tilghman, Assistant to the Dean