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March 25, 2010

To: Phyllis Wise, Provost
Douglas J. Wadden, Executive Vice Provost for Academic Affairs and Planning

From: Gerald Baldasty, Vice Provost and Dean
James S. Antony, Associate Vice Provost and Associate Dean for Academic Affairs

RE: Review of the Department of Chemical Engineering

This memo outlines the recommendations from the review of the Department of Chemical Engineering and its Bachelor of Science in Chemical Engineering (BSChE), Master of Science in Chemical Engineering (MSChE), Master of Science in Engineering (MSE), and Doctor of Philosophy (PhD) degree programs. Detailed comments on the program can be found in the documents that were part of the following formal review proceedings:

- Chemical Engineering self-study (February, 2009)
- Charge meeting between review committee and administrators (March 31, 2009)
- Site visit (April 23-24, 2009)
- Review committee report (May 20, 2009)
- Chemical Engineering response to the report (December 16, 2009)
- Graduate School Council consideration of review (February 18, 2010)

The review committee consisted of:

Larry R. Dalton, Professor, UW Chemistry (Committee Chair)
Christopher S. Bretherton, Professor, UW Atmospheric Sciences and Applied Mathematics
Christina M. Mastrangelo, Associate Professor, UW Industrial Engineering
Jane Frommer, IBM Almaden Research Center, San Jose, CA
Dennis W. Hess, Professor, School of Chemical & Biomolecular Engineering, Georgia
Institute of Technology

A subcommittee of the Graduate School Council presented findings and recommendations to the full Council at its meeting on February 18, 2010. After discussion, Council recommended continuing status for the department, with the next review to be scheduled for the 2018-2019

academic year. Specific comments and recommendations regarding the department and its degree programs include the following:

Program Strengths

- This is a highly ranked and well regarded program, with a distinguished faculty who maintain the core traditional education program of chemical engineering while simultaneously engaging the department in, as well as hosting, many multidisciplinary research centers. The department maintains a stellar record of research and education, particularly when the size of the department is considered.
- The department does an excellent job of education at both the undergraduate and graduate levels. Both the undergraduate and graduate programs produce highly qualified graduates who find jobs across a very diverse span of industries and specializations.
- The department was praised by the review committee for its high levels of external, mostly Federal, funding and its existing research centers in the areas of energy, environment, nanotechnology, and biotechnology.
- The department has been very successful in nurturing its young professors who have routinely matured into distinguished leaders of international reputation and acclaim by the middle of their careers. This is an extremely strong faculty particularly in the emerging areas of biomedical engineering, nanotechnology, and molecular engineering.
- The department is consensus-driven, cohesive, collegial, and conservative – traits which have been necessary for maintaining the traditional role of chemical engineering in providing process engineers to a wide variety of critical industries.

Challenges & Risks

- The department needs to coordinate its strategic plan with the Molecular Engineering initiative. This is critical since Chemical Engineering has high stakes in the Molecular Engineering undertaking and should be a central player.
- An associated challenge has been for the department to embrace more aggressive and decisive leadership and to more actively pursue the development of multi-disciplinary and multi-investigator grants. The department is situated within the center of an industrial community dominated by tremendously large textile, pharmaceutical, and petrochemical firms, and it would benefit by assuming a more commanding posture and becoming a lead organization for new initiatives and cutting edge research.
- Leadership transitions in the department may complicate some aspects of advancing the strategic plan of the department.
- The Department's small size places it in a vulnerable position. The review committee report made several recommendations for the department to guard against attrition of its faculty, staff, and TAs. Currently, the department covers its responsibilities and leads in many areas, but its current size makes it teeter on critical mass for leadership in Molecular Engineering, multi-investigator research, and curriculum renovation. It is clear that its small size has also limited its growth in the national rankings.
- A major challenge will continue to be navigating a successful balance between the traditional and emerging areas of chemical engineering, such as nanotechnology, biotechnology, and biomedical engineering, and to provide effective mentoring of students between the undergraduate and graduate programs.

- While the department is small, it should continue to strive for improvements in the gender and ethnic diversity of its faculty, at least aiming to match to that of its graduate student population. The department should be encouraged to become a national leader in gender and ethnic diversity as part of its strategic vision. Obviously, making new hires in the department is critical to addressing this issue.

Areas of Concurrence and/or Disagreement

- Overall, the departmental response shows broad concurrence with the assessment and acceptance the recommendations of the review committee.
- The College of Engineering has committed 1.5 new FTEs and partial start-up funds to the department, which hopes to fill these positions with “a mid-career molecular engineer” and a collaborative appointment with the Bioresource Science and Engineering program (College of the Environment). These hires should contribute to upgrading both the undergraduate and graduate education programs.
- The review committee also recommended more formal mentoring programs at several levels; some effort towards this already has been made.
- The review committee also recommended that the department consider offering “revenue-producing continuing education courses;” at this point, the department’s efforts are focused elsewhere, and they are not currently acting on this suggestion.

Graduate School Council Recommendations

- The Graduate School Council recommends that the Department of Chemical Engineering continue to offer its graduate and undergraduate degree programs and that its next review be undertaken in 10 years (2018-2019).
- The department is urged to continue its efforts to address the review committee recommendations, some of which are reflected in the “Challenges and Risks” section above, and all of which were felt to be pertinent and constructive.

We concur with the Council’s comments and recommendations.

cc: Matthew O'Donnell, Dean, College of Engineering
Daniel T. Schwartz, Chair, Chemical Engineering
John D. Sahr, Associate Dean, Undergraduate Academic Affairs
David Canfield-Budde, Academic Program Specialist, The Graduate School
Members of the Review Committee
Members of the Graduate School Council
Jake Faleschini, President, GPSS