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April 20, 2004

To: David B. Thorud
Acting Provost

From: Gail L. Dubrow
Associate Dean for Academic Programs, Graduate School

Re: Industrial Engineering Program Review

Summary and Recommended Action

At its meeting of February 5, 2004, the Graduate School Council met with members of the team reviewing the Industrial Engineering Program; with the Acting Director of the Program; and with the Dean of the College of Engineering. The Council recommended continuation of the Industrial Engineering Bachelor of Science, Master of Science, and Doctor of Philosophy degree programs, with the next review in 5 years. The Program should also undergo a mid-term College review in 2.5 years to evaluate its progress towards specific goals that it formulates in a strategic plan, taking into account the review committee's recommendations. Past leadership did not make necessary progress on core issues facing the Program, such as developing a common vision, providing faculty mentoring, and developing more limited numbers of areas of research emphasis. The current director should be commended for recent progress on these issues. The Council recommends that future changes in the Program regarding continuing status and possible departmental status be contingent upon the Program's sustained progress towards goals it formulates in coordination with the College dean.

I concur with the Council's recommendations and comments.

Background

The Industrial Engineering Program offers Bachelor of Science, Master of Science, and Doctor of Philosophy degrees in Industrial Engineering. Industrial Engineering at UW originated as a fifth-year, second-degree undergraduate program for students who had completed the requirements for a degree in one of the other branches of engineering. In 1976 a regular, four-year Bachelor of Science degree in Industrial Engineering was instituted, taught by faculty in the Mechanical Engineering Department. The program was accredited by the Accreditation Board for Engineering and Technology (ABET) in 1986. At that time (1987) the Industrial Engineering Group was separated administratively from Mechanical Engineering and given academic program

status. From 1989 to 1994, the Program graduated Master of Science students through the College of Engineering's interdisciplinary option and doctoral students through the Mechanical Engineering Ph.D. program. In 1998 the Industrial Engineering Program was given authority to grant two graduate degrees: Master of Science in Industrial Engineering and Doctor of Philosophy in Industrial Engineering.

The UW Program offers the only Industrial Engineering degrees in Washington State. Graduates of the Program are of critical importance to the State and to the Pacific Northwest. Industrial Engineers are traditionally employed in a manufacturing setting, where they work on facilities design, processing, quality, scheduling, personnel, and warehousing. They increasingly find employment in service and other sectors because of their wide range of skills in the mathematical, physical, and social sciences, together with a strong background in engineering analysis and design. The Program currently has nine core faculty members, with approximately 63 undergraduate majors (25-35 degrees per year) and 45 enrolled graduate students in 2001 (24 masters, 21 PhD).

The review committee included five members, three internal and two from peer institutions. The committee was chaired by Joe Mahoney, Professor in the Department of Civil and Environmental Engineering, and included as the other internal members Ted Klastorin, Professor in the Business School, and Michael Morgan, Professor in the Department of Environmental Health. The external members of the committee included Candace Yano, Professor of Industrial Engineering and Operations Research at the University of California-Berkeley, and Mohamed I. Dessouky, Professor of Industrial and Systems Engineering at the University of Southern California. They carried out the review during spring quarter 2003, including a review of the self-study and a two day site visit scheduled May 22-23, when they met with faculty, students, staff, and the College dean. The site visit ended with an Exit Interview between the review committee and administrators. Program representatives were present for the first half of this session.

Exit Interview

The review committee expressed support for the program, highlighting its accessible and committed faculty, highly motivated students, and its effective and motivated staff. The committee also expressed some serious concerns about the Program and suggested substantive changes in order to bring it in line with contemporary needs and to better serve students, the University, and the community. Especially the undergraduate curriculum, perceived as badly outdated, was viewed as in need of revision through updated course offerings and a reduced number of sections taught by IE faculty. Program Faculty – especially with a view towards future hires – should focus more strongly on fewer topic areas, while the need exists for increased collaborative research efforts, both across campus and within the Program. Currently the faculty tends towards insularity in its academic endeavors.

Council Discussion of Committee Report and Program Response

Discussion with the Director revealed that the Program has made curricular changes since the site visit. Program faculty has approved a revised undergraduate curriculum that offers more flexibility, while it reduces faculty teaching load. The goal of this change is to allow faculty to focus more on research and to expand collaborative research efforts, specifically in integrated logistics systems and bio-industrial systems.

The Council recommends that the Program increase cross-unit collaboration. The review committee recommended expanding the joint MBA/BSIE degree, since it currently is too limited

to have much impact. Graduate Program requirements should be modified to allow students to take relevant courses in other departments. Recent efforts at reaching out to other units such as Statistics, the Business School, and the School of Medicine should be continued.

A unit's future largely rests on its support of new and junior faculty. The Program should place increased emphasis on supporting junior faculty through effective recruitment, tenure, and promotion. In addition, a faculty mentoring policy should be created to provide an essential tool for supporting newer faculty as they mature as scholars.

The Program feels strongly that its effectiveness and standing as a program would increase if granted departmental status. But as top Industrial Engineering programs retool to focus on new areas such as nanotechnology and ergonomic engineering in virtual environments, a more significant factor in raising its standing may be its capacity to position itself to compete for students and research faculty in these cutting-edge areas of inquiry. Discussion between the Council and the College dean suggested that any future shift to departmental status should be tied to the Program's progress towards goals that it formulates in coordination with the dean, and that these criteria are clearly communicated to faculty and staff. In order to implement these changes, the Program should prepare a well-defined strategic plan that reflects increased Program focus and a method for adapting to changes in the field. This should be part of ongoing communication between the College and the Program with the goal to improve the function and caliber of the Program. The decision of the Accreditation Board for Engineering and Technology (ABET) to review the Program after two years, out of a maximum possible of six years, is cause for concern. Progress reports should address the unit's response to ABET findings.

cc: Lee Huntsman, President
Elizabeth L. Feetham, Acting Dean, Graduate School
Denice Denton, Dean, College of Engineering
Richard Lee Storch, Director, Industrial Engineering Program
Members of the Review Committee
Graduate School Council
David Canfield-Budde, Assistant to the Dean, Graduate School