



UNIVERSITY OF WASHINGTON

October 7, 2003

Marsha L. Landolt
Dean and Vice Provost of the Graduate School
Box 353770
University of Washington

Subject: Review of the Industrial Engineering Program

Dear Dean Landolt:

Enclosed is the final report of the Industrial Engineering Program for the ten-year review. All members of the Committee support the recommendations in the report.

The Industrial Engineering BS, MS, and PhD degree programs should be continued and the next IE review should be scheduled no sooner than five years. Additional recommendations are contained in the report.

Sincerely,

Joe P. Mahoney
Chair, Industrial Engineering Review Committee

Cc: Heidi Tilghman, Assistant to the Dean for Academic Programs
Industrial Engineering Review Committee

October 7, 2003

Report of the Industrial Engineer Program Review Committee

Introduction

The Review Committee was constituted in a letter from Marsha L. Landolt, Dean and Vice Provost, The Graduate School, March 31, 2003. The Review Committee members from the University of Washington were:

- Professor Joe Mahoney, Department of Civil and Environmental Engineering
- Professor Ted Klastorin, Management Science Department
- Professor Michael Morgan, Environmental Health

The external members of the Review Committee were:

- Professor Candace Yano, Department of Industrial Engineering and Operations Research, University of California, Berkeley
- Professor Mohamed Dessouky, Daniel J. Epstein Department of Industrial and Systems Engineering, University of Southern California

The Process

The review process contained several elements. These were:

- Review of documents
 - Documents related to graduate degree granting status
 - Graduate School Self-Study document
- On-campus Review Committee member meeting with Dean Denton and Graduate School representatives (April 17, 2003)
- Submittal of supplemental questions to the IE Program by the Review Committee
- Responses to supplemental questions by the IE Program
- On-campus site visit (May 22-23, 2003)—see Appendices A and B
 - Interview with Tony Woo, Director, IE Program
 - Interviews with IE faculty
 - Interview with IE staff
 - Discussions with IE Visiting Committee
 - Meetings with IE undergraduate students via two separate venues (classroom and computer lab) including completion of Review Committee questionnaire
 - Meeting with IE graduate students
 - Meeting with IE Student Advisory Board (both undergrad and graduate students)

- Interview with Denice Denton, Dean, College of Engineering

The information gained from these activities helped to form the Review Committee's findings and recommendations.

Throughout the process, the cooperation of the IE Program and specifically Director Woo met or exceeded any reasonable expectations for providing needed/requested information to the Review Committee. Further, the Graduate School and specifically Dr. Heidi Tilghman facilitated correspondence, the site visit agenda and venues, and related matters. They also are to be commended.

Findings

The following findings are based on the process outlined above and will be grouped by strengths and weaknesses:

Strengths

1. The IE Program is critical to the State of Washington and the Pacific Northwest. Its graduates are performing important roles in manufacturing industries (such as Boeing, PACCAR, etc) and in the evolving services arena (such as Microsoft, health care, etc). Their skills are applied in wide ranging areas including quality control, lean manufacturing, supply chain improvement, simulation, etc.
2. The undergraduate program is a strength of the IE Program and produces qualified, enthusiastic students who are well appreciated by industry.
3. The collaboration with industry for the undergraduate program is excellent.
4. The IE graduate program is running smoothly and performing adequately.
5. The IE faculty teaching load is reasonable (typically four courses per year and three courses per year for new faculty). This is in line with other College of Engineering departments.
6. The IE staff is highly motivated and effective. The student advising provided by the staff is deeply appreciated by the IE students.
7. The IE faculty is very accessible and committed to a quality education for both undergraduate and graduate students.
8. The students are a cohesive group and highly motivated. They are very supportive of the IE Program. The students find the small size of the Program a net benefit.
9. The Review Committee noted that the IE Program recently received a two year accreditation from the Accreditation Board for Engineering and Technology (ABET) during the 2001-2002 review cycle.

Weaknesses

1. The undergraduate curriculum is inconsistent with contemporary needs. The curriculum is too rigid.
2. The IE Program has too few faculty (currently 7.0 FTE at the time of the review) to cover a broad curriculum.
3. The graduate program course offerings are limited.

4. The IE Program is at a disadvantage due to multiple locations of faculty and students.
5. The IE faculty feels it is a disadvantage to be without a department designation. This affects faculty and student interaction as well as grant and contract competition.
6. The mentoring of young faculty is not consistent. Expectations for Promotion and Tenure are not communicated clearly and timely.

Recommendations

1. Restructure the undergraduate curriculum to update the course offerings and reduce the number of undergraduate sections taught by the IE faculty. The curriculum should be modified to add a number of important areas such as service systems and information technology.
2. The IE faculty should consider stronger concentration in fewer topic areas. Future hires should reflect those concentrations and facilitate improved collaboration among faculty and students.
3. The IE faculty should prepare a well-defined and cogent strategic plan that reflects a greater degree of concentration. New faculty positions should be allocated to the IE Program to support the strategic plan.
4. The mentoring and evaluation systems for young faculty should be clarified.
5. The curriculum should be reorganized to include more 400 level courses that would benefit both seniors and graduate students.
6. The collaboration with the Business School needs to be increased. The joint MBA/BSIE degree is too limited to have much of an impact.
7. Modify the graduate program by adding IE graduate course offerings and allow relevant courses from departments such as Mathematics, Statistics, etc.
8. All IE Program faculty, staff, and graduate students should be in one well defined contiguous space that will encourage interaction.
9. The Dean of the College of Engineering should provide the program criteria by which the program can become a full department. In response to those criteria, the IE Program should develop a plan to identify and meet the conditions needed for achieving department status and communicate it to the IE faculty and staff.
10. The Industrial Engineering BS, MS, and PhD degree programs should be continued. The next IE review should be scheduled no sooner than five years.

Resources

Graduate School (2003), "Review Committee Materials for 2002/03 Department of Industrial Engineering Program Review," University of Washington, March 31, 2003.

Graduate School (2002), "Graduate School Self-Study—Industrial Engineering Program," Prepared by the Industrial Engineering Program, University of Washington, November 27, 2002.

Graduate School (1996), "Report of the Industrial Engineering Graduate Program Review Committee," University of Washington, June 14, 1996.

Appendix A

Summary of Comments by IE Undergraduates, Graduate Students, Faculty, and Visiting Committee

UG Student Comments—Positives¹

1. Small IE Program a plus. Gender mix is excellent.
2. Faculty interaction excellent.
3. Plant tours are helpful.
4. Senior design project is applied and relevant.

UG Student Comments—Suggested Improvements¹

1. Increase interaction with Business School.
2. Increase computer-oriented training and use.
3. Increase interaction with HIT Lab.
4. Increase course availability and electives.
5. Lack of unified space for IE Program.

IE Faculty Comments—Positives

1. IE advising works well—good mix of staff and faculty advisors.
2. Evening degree program a plus; however, concerns expressed by younger faculty.
3. All UG courses supported by TAs.
4. Faculty teaching load reasonable—typically four courses per year.
5. Strongly held view that UGs are well trained and prepared for job market.
6. Overall quality of graduate students adequate.

IE Faculty Comments—Suggested Improvements

1. Scheduling of classes.
2. Need to add two or three new faculty. Differing views expressed on the specialization areas.
3. Undergraduate curriculum is too rigid—all UG courses required for graduation.
4. Need more domestic graduate student applicants. IE needs more visibility.
5. Masters students
 - Time to graduation: About two years for thesis option.
 - Time to graduation: About five quarters for nonthesis option.
6. IE should become a department.
7. Faculty mentoring process needs improvement. Young faculty are not succeeding, as they should. Check on annual faculty reviews.
8. Decision-making within program a bit ambiguous.
9. A major need is to have the program located in one unified space (one building).
10. Faculty want to understand the “lack of focus” issue that was noted by others outside the IE Program. A general view on this is that IE is a broad field. Further, diversity is strength. A differing view was that diversity results in a lack of collegiality.
11. Several faculty stated that they are proud of accomplishments and progress since mid-1980s.

12. Future directions for IE Program could include a focus on health care.
13. The IE Program has not had adequate support from the administration.

IE Visiting Committee—Positives

1. Pleased with the recent IE Program ABET review.
2. IE Program needs to continue its positive direction.
3. Senior design project is working very well.
4. “Mock” job interviews are helping to prepare UGs for job market.

IE Visiting Committee—Suggested Improvements

1. Corporate leaders need to improve support for the Program.
2. Enhance interaction with Business School. Industry needs IE graduates with business skills.

Graduate Students—Positives

1. Program is small and that aids advising process.

Graduate Students—Suggested Improvements

1. Program is small resulting in a limited number of graduate classes.
2. Course requirements for Masters should be loosened.
3. Program location and lack of unified space inhibits student collaboration.
4. Want more interaction with the Business School, Math Department, etc. In general, want more “bridges” to other, relevant departments.
5. Want more certificate programs as illustrated by the Graduate School certificate in Global Trade, Transportation, and Logistics.

Notes

- 1: Includes results of survey conducted by the IE Review Committee.

Appendix B Site Visit Agenda

**University of Washington
The Graduate School**

**Industrial Engineering
Decennial Program Review
May 22-23, 2003**

Wednesday, May 21

6:00 p.m. Review Committee Executive Session
Palisades Waterfront Restaurant
2601 West Marina Place

Thursday, May 22

9:00 a.m. Class Visit, INDE 433, More Hall 221

9:30 a.m. Tony Woo, Director, Industrial Engineering Program, MEB 106

10:30 a.m. Assistant Professor Benita Beamon, MEB 106

11:00 a.m. Associate Professor Cindy Atman, MEB 106

11:30 a.m. Assistant Professor Joyce Yen, MEB 106

12:30 p.m. Visiting Committee Lunch, Husky Union Building, 209B
Jeff Alberts, Boeing Commercial Airplane
Gregg Dorazio, Honeywell
Richard Hansen, Transportation Security Administration
Joe Heim, Genie Industries

2:00 p.m. Meeting with undergraduate students
Undergraduate Computing Lab, Engineering Annex 153

2:30 p.m. Professor Zelda Zabinsky, MEB 106

3:00 p.m. Professor Richard Storch, conference phone call (206) 409-8637

3:30 p.m. Professor Tom Furness, MEB 106

4:00 p.m. Professor Kailash Kapur, MEB 106

4:30 p.m. Meeting with Graduate Students, MEB B14

6:30 p.m. Review committee dinner
Nell's Restaurant
6804 East Green Lake Way North

Friday, May 23

- 9:00 a.m. Meeting with Staff, MEB 106
- 10:00 a.m. Visiting Associate Professor Christina Mastrangelo, MEB 106
- 10:30 a.m. Student Advisory Board, MEB 106
- 11:15 a.m. Dean Denice D. Denton, Loew 355
- 12:00 p.m. Lunch with Director Tony Woo, Faculty Club South Dining Room
- 1:00 p.m. Review committee executive session, MEB 106
- 3:00 p.m. Exit interview I, Loew 355
David Thorud, Acting Provost
Marsha Landolt, Vice Provost and Dean, Graduate School
John Slattery, Associate Dean for Academic Programs, Graduate School
George Bridges, Vice Provost and Dean, Undergraduate Education
Denise Denton, Dean, College of Engineering
Tony Woo, Director, Industrial Engineering Program
Other Program representatives
- 4:00 p.m. Exit interview II, Loew 355
As above, without Program representatives
- 5:00 p.m. Site visit concludes