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March 9th, 2020

To: Nancy Allbritton, Dean, College of Engineering

From: Joy Williamson-Lott, Dean

Kima Cargill, Associate Dean for Academic Affairs and Planning

RE: Review of the Department of Chemical Engineering (2018 – 2019)

This memorandum outlines the Graduate School's final recommendations from the Department of Chemical Engineering academic program review. Detailed comments on the review can be found in the documents that were part of the following formal review proceedings:

- Charge meeting between review committee and administrators (May 25th, 2018)
- Self-Study (March 25th, 2019)
- Site visit (May 9th – 10th, 2019)
- Review committee report (June 28th, 2019)
- Department of Chemical Engineering response to the report (November 12th, 2019)
- Graduate School Council consideration of review (February 6th, 2020)

The review committee consisted of:

Per Reinhall, Professor and Chair, UW Department of Mechanical Engineering (Committee Chair)

Mari Ostendorf, Professor, UW Department of Electrical Engineering

Lorenz Biegler, Professor and Head, Department of Chemical Engineering, Carnegie Mellon University

Anthony Muscat, Professor and Chair, Department of Chemical and Environmental Engineering, University of Arizona

The Department of Chemical Engineering offers the following degrees: Bachelor of Science in Chemical Engineering, Master of Science in Chemical Engineering, and Doctor of Philosophy.

Members of the Graduate School Council presented findings and recommendations to the full Council at its meeting on February 6th, 2020. A summary of this report, composed by Graduate School Council Members, is attached to this document.

Graduate School Council Recommendations

The Graduate School Council commends Department of Chemical Engineering on the strength of its programs, faculty, and students. After discussion, the Council recommended the following:

- Full academic program review in 10 years (2028 – 2029)

We concur with the Council's recommendations.

cc: Mark Richards, Provost and Executive Vice President
Patricia Moy, Associate Vice Provost for Academic and Student Affairs, Office of the Provost
Jim Pfaendtner, Chair, Department of Chemical Engineering
Becky Corriell, Director, Academic Affairs & Planning, the Graduate School
Academic Unit Review Committee Members
Members of the Graduate School Council
GPSS President

Attachment

University of Washington | Graduate Council

Summary of the review of the Department of Chemical Engineering

Academic Unit Name: Department of Chemical Engineering

Degrees/Certificates Included in the Review:

1. B.S. Chemical Engineering
2. M.S. Chemical Engineering
3. Ph.D. Chemical Engineering

Program Strengths:

1. The Chem. Eng. program is on cusp of being a top department (it was ranked 24 US News & World Report, has great new hires and young faculty, high impact and well-cited research, well-funded research in general areas of Molecular Engr and Nanotechnology, great working culture and environment, strong culture of leadership, MoIE and NanoES facilities are world class).
2. The Chem. Eng. program has a strong diversity plan (hired 33% female, 17% URM faculties since the last review).
3. The Chem. Eng. program has unique features in educational programs (Incorporated molecular and nano-science in traditional undergraduate ChE curriculum, will add Data Science program at graduate level, an annual faculty peer review system for undergrad core courses)
4. The Chem. Eng. program has a strong undergraduate advising and professional development as well as a strong faculty mentorship program.
5. The Chem. Eng. program has active student organizations.
6. The Chem. Eng. program has very supportive and skilled staff.
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Challenges & Risks:

1. The Chem. Eng. program has challenges in recruiting PhD students (8 this year, declining from ~12 in previous years) and graduate job placement (BS: only 52% are placed in industry or grad school at the time of graduation, MS: Only 37% are placed at the time of graduation, PhD: data is needed).
2. The career path is not well understood by the lecturer in the department. A better mentoring and career development strategy is needed.
3. The Chem. Eng. program has challenges to modernize their curriculum. Some suggestions are made by the review committee (for example, consider making Python a part of freshman computing, upgrade lab facilities, and expand the data science program).
4. The Chem. Eng. research program strongly depends on molecular and nano science and engineering. The program should consider broadening research portfolio in the department.
5. Upgrading and maintaining the building hurts department budget. The department needs stronger support from the College and the University for maintenance to allow it to innovate on educational and research programs. Also, current building appears to be at capacity which limits growth in educational programs, faculty offices and research capacity.
6. The MS and undergraduate program depend on international students.

Areas of Concurrence/Disagreement:

1. The Department and Review Committee exhibit broad general agreement across most program strengths and challenges.
2. The Department agrees that the high international student enrollment in the MS program (35% international students in MS) and hope to reduce that number when a data science track is developed. They disagree on dependency on international students for the undergraduate program (13% international students in BS).

Graduate School Council Recommendations:

1. The Graduate School Council recommends continuing status for all UW Department of Chemical Engineering degree programs with next review taking place in 10 years.