

UNIVERSITY OF WINDSOR
UNIVERSITY PROGRAM REVIEW (UPR)
FINAL ASSESSMENT REPORT ON: Civil and Environmental Engineering
UNDERGRADUATE AND GRADUATE PROGRAMS
January 2023

Executive Summary of the Cyclical Program Review of the Department of Civil and Environmental Engineering's Programs

In accordance with the University's Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external review and the internal responses of the undergraduate and graduate programs in the Department of Civil and Environmental Engineering.

In addition to identifying the significant strengths of the programs, together with opportunities for program improvement and enhancement, the report prioritizes the recommendations that have been selected for implementation and sets out a plan (including the agent(s) responsible for addressing the recommendations and deadline dates) for follow-through. Timelines for monitoring the implementation of the recommendations are built into the process, with areas reporting mid-cycle on their progress to the Senate Program Development Committee, or earlier where there are significant concerns requiring urgent follow-up.

The Department of Civil and Environmental Engineering's 2019-2020 Self-Study, submitted to the Office of Quality Assurance on February 17, 2022, included: 1) descriptions and an analysis of the programs, their learning outcomes, curriculum structure, and student experience; 2) information on enrolments as well as financial, physical and human resources; and 3) the program data including the standard data package provided by the Office of Quality Assurance. Appended to the Self-Study were faculty member CVs, undergraduate curriculum maps, course descriptions and syllabi, the articulation agreement with St. Clair College, and the prior cyclical program review report.

The Department of Civil and Environmental Engineering programs were reviewed by Dr. Gopal Achari, Schulich School of Engineering, of Calgary; Dr. Michael Bartlett, Department of Civil and Environmental Engineering, Western University; and Dr. Joel Gagnon, School of the Environment, University of Windsor. In addition to assessing the Self-Study, the Review Team conducted a two-day virtual site visit on June 14-15, 2022, which included meeting with faculty, students, administrative support staff, technical staff, the Graduate Civil Engineering and Environmental Engineering Coordinators, the Undergraduate Civil Engineering Advisor, the appointments and renewal, tenure, and promotion committees, the Head of the Department of Civil and Environmental Engineering, the Dean of the Faculty of Engineering, and the Associate Vice-President, Academic.

In their report (June 27, 2022), the Review Team noted that the programs meet the IQAP evaluation criteria and are consistent with the University of Windsor's mission statement. Specifically, the Review Team noted that the program requirements are clear and that the basic assessment methods are conventional and based on CEAB-mandated procedures to assess student progress towards learning outcomes, both of which are consistent with those at other Canadian engineering programs. The programs are delivered by dedicated faculty, with strong research profiles, committed to educating undergraduate and graduate students and to providing an exceptional and supportive student experience. The Review Team noted that interactions between both the faculty and staff, and the students were described by all parties as positive and exceptional.

It was also noted that admission requirements are adequate and appropriately aligned with learning outcomes. However, the reviewers did note that, while graduate programs had University program and course learning outcomes, the undergraduate programs confused University program and course learning outcomes with the CEAB Graduate Attribute Indicators. This was identified as an area requiring clarification; though the Review Team did confirm that the Department regularly collects data on the Graduate Attribute Indicators and has created and implemented a continuous improvement process, consistent with CEAB requirements.

Overall, the Review Team noted that they were impressed with the quality of leadership at the Department and Faculty level, and concluded that the Department offers basic, broad, solid programs in civil and environmental engineering, but that curriculum review and renewal was past due. The Review Team were pleased to learn that the Department has launched an undergraduate curriculum review with the intent of overhauling its programs, which have not changed significantly in some time. As part of this review, the Department should investigate and address the causes of undergraduate attrition rates, particularly at the end of first year, which the reviewers noted seem high. The reviewers also noted that the Department should also reassess its projected enrolment numbers for the undergraduate programs to ensure program viability and sustainability, as intakes of 40 and 10 for civil and environmental engineering undergraduate programs, respectively, were identified as quite low. The graduate curriculum should also be reviewed as reviewers noted that it had not changed appreciably in the past few years. The Review Team also raised concerns around clarity of criteria and provision of funding for graduate students.

The Head of the Department of Civil and Environmental Engineering and Dean of the Faculty of Engineering submitted their responses to the External Reviewers' Report (June 2022), addressing the recommendations, identifying follow-up actions, and providing clarification or corrections, as appropriate. The Senate Program Development Committee (PDC) Final Assessment Report and Implementation Plan (January 2023) considered all the above documentation. The Executive Summary and Implementation Plan, along with any response from the area on the final recommendations, were submitted to Senate in February 2023.

Final Recommendations and Implementation Plan (in priority order within each category)

Final recommendations were arrived at by the Program Development Committee, following a review and assessment of the External Reviewers report, the response from the Department of Civil and Environmental Engineering, and the Dean's response.

General

Recommendation 1: That the Department report on the initiative to renew its standards for Renewal, Tenure, and Promotion in collaboration with the other units in the Faculty. (Section 2.6)

Agents: Head, Department Council, Dean of the Faculty

Completion by: Fall 2023

Recommendation 2: That the Department follow Senate Bylaw 22 and the terms of the Faculty Collective Agreement concerning triennial reviews of tenured faculty members. This will require revising the RTP Standards to include metrics for such reviews. (Section 2.6)

Agents: Head, Department Council

Completion by: Fall 2023

Recommendation 3: That the Department develop a structured mentoring program so that younger tenure-track faculty have the guidance that they need to succeed. While a mentor-mentee relationship can develop organically, a formal recognition of the role of mentor would encourage more senior faculty to take on the role. (Section 2.6)

Agents: Head, Department Council

Completion by: Fall 2023

Undergraduate Programs

Recommendation 4: That the Department prepare curriculum maps for both the BAsC in Civil Engineering and the BAsC in Environmental Engineering programs to look for gaps, redundancies, and opportunities for improvement, including articulating the alignment with the CEAB graduate attributes. (Section 2.1)

Agents: Head, Department Council

Completion by: Fall 2024

Recommendation 5: That the Department report on 1) its collection of data on the 33 CEAB Graduate Attributes and 2) its progress in implementing a Continuous Improvement Process in accordance with CEAB Accreditation criteria. This will inform activities under recommendation 6. (Section 2.8)

Agents: Head

Completion by: Fall 2024

Recommendation 6: That the Department report on efforts to review and revise the undergraduate curriculum in the Civil and Environmental Engineering programs, including: (Section 2.3)

- a) developing new, relevant courses (e.g., Smart Cities, BIM, or other new, dynamic areas), which would attract more students to both programs. (Section 2.3)
- b) eliminating the 8-month Environmental Engineering co-op work term and replacing it with two four-month work terms, aligned with those of the other undergraduate engineering programs. (Section 2.3)

Agents: Head, Department Council, Centre for Teaching and Learning, Office of Experiential Learning

Completion by: Fall 2024

Recommendation 7: That the Department work with industrial contacts to increase the number of capstone design projects available, in order to better accommodate the students' individual aspirations. Surveying the students in the Year 3 Summer term to determine their capstone design project topic preferences may help identify and focus industrial partners and projects. (Section 2.3)

Agents: Head, Dean of the Faculty, Office of Experiential Learning

Completion by: Winter 2024

Recommendation 8: That the Department use existing industrial contacts to develop more environmental engineering co-op placement opportunities. The use of an Industrial Advisory Board for the program may also lead to more co-op opportunities. (Section 2.4)

Agents: Head, Dean of the Faculty, Office of Experiential Learning

Completion by: Winter 2024

Recommendation 9: That the Department report on the ongoing process for advising undergraduate classes earlier about the opportunities to continue to pursue graduate studies at Windsor so that they may have more time to interact with potential research advisors and apply for external and internal scholarship funding (Section 2.6).

Agents: Head

Completion by: Fall 2023

Graduate Programs

Recommendation 10: That the Department review the MEng program enrolments and admission requirements with a focus on improving the quality and consistency of incoming students. (Section 2.2)

- (a) As part of the review of admission criteria, that the Department consider the institutions that prospective students have attended during their BSc degrees before granting admission to the MEng program.

Agents: Head, Department Council, Dean of the Faculty, Registrar, AVP Enrolment Management

Completion by: Fall 2024

Recommendation 11: That the Department streamline the MEng courses and revisit the number of courses that are being taught by sessional instructors (Section 2.5).

Agents: Head, Dean of the Faculty, Department Council

Completion by: Fall 2024

Recommendation 12: That the Department generate a program map, identifying the five technical courses for MEng students with limited flexibility to accommodate students with varying backgrounds. The program map for Civil Engineering students should be distinct from the one for Environmental Engineering students. (Section 2.3)

Agents: Head, Department Council

Completion by: Fall 2024

Recommendation 13: That the Department develop a plan to increase research funding from traditional and non-traditional (non-Tri-Council or government-funded research organization) sources to fund MASc and PhD students, with a view to eventually developing a policy of minimum guaranteed funding for 2 years for all MASc and 4 years for all PhD students. (Section 2.2)

Agents: Head, faculty members, Dean of the Faculty, Vice-President, Research and Innovation, Office of Research and Innovation Services

Completion by: Fall 2023

Recommendation 14: That the Department report on:

- a) plans to increase the number of entrance scholarships for MASc and PhD students, and
- b) the cause of delays in the distribution of entrance scholarships and possible solutions to eliminating these delays. (Section 2.2)

Agents: Head,

Completion by: Fall 2025

Recommendation 15: That the Department be transparent about the criteria by which it determines total funding for a student, with a view to providing equal funding amounts to students in the same program regardless of whether they are domestic or international students. (Section 2.7)

Agents: Head, Dean of the Faculty

Completion by: Fall 2024

Recommendation 16: That the Department develop a core course for all thesis-based graduate students that teaches students how to conduct critical literature reviews, avoid plagiarism, develop research questions and proposal, understand research methods, and conduct statistical data analysis. (Section 2.1)

Agents: Head, Department Council

Completion by: Spring 2024

Recommendation 17: That the Department report on efforts to develop thesis-based graduate student's knowledge and training in areas of engineering leadership, innovation and entrepreneurship, and prepare them for careers in which they seek to advance and market their innovations. (E.g., use/promotion of Mitacs professional development opportunities <https://www.mitacs.ca/en/programs/training/program-details>) (Section 2.3)

Agents: Head, Associate Dean, Research, Vice-President, Research and Innovation, Office of Research and Innovation Services

Completion by: Fall 2024

Recommendation 18: That the Department establish a best practice whereby instructors meet with their GAs within the first week of term to complete the required Form 1, which sets out the duties and expectations (including time commitment) of the GA position for the term, and that instructors continue meeting regularly with their GAs throughout the term to ensure duties and expectations met. (Section 2.5)

Agents: Head, Dean of the Faculty

Completion by: Fall 2024