UNIVERSITY OF WINDSOR
UNIVERSITY PROGRAM REVIEW (UPR)
REPORT ON: Civil and Environmental Engineering
GRADUATE AND UNDERGRADUATE PROGRAMS
March 2018

EXECUTIVE SUMMARY

Review Preparation
In preparing this document, the Program Development Committee reviewed the following: Civil and Environmental Engineering's Self-Study (SS) (2012/2013), the report of the external reviewers (ER) (May 2017), the response from the Head (HR) (November 2017), and the response from the Dean (DR) (December 2017) to the above material. The external reviewers were: Dr. Mark Green, Department of Civil Engineering, Queen's University, Dr. Ronald Thring, Department of Environmental Engineering, University of Northern British Columbia, and Prof. Marcia Valiante, Faculty of Law, University of Windsor.

Undergraduate and Graduate Programs
At the undergraduate level, the Department offers a Bachelor of Applied Science in Civil Engineering, a Bachelor of Applied Science in Environmental Engineering, a post-undergraduate Honours Certificate in Civil Engineering, and a post-undergraduate Honours Certificate in Environmental Engineering. The Department also offers a degree completion pathway for the Bachelor of Applied Science in Civil Engineering for Graduates of St. Mary's University Diploma of Engineering, as well as an articulation agreement pathway for graduates of St. Clair College's Civil Engineering Technology program.

The Department participates in the Bachelor of Engineering Technology, administered by the Dean's Office, through the delivery of a Civil Engineering stream.

At the graduate level, the Department offers a Master of Applied Science in Civil Engineering, a Master of Applied Science in Environmental Engineering, a Master of Engineering in Civil Engineering (with/without Co-op or Internship Option), a Master of Engineering in Environmental Engineering (with/without Co-op or Internship Option), a PhD in Civil Engineering, and a PhD in Environmental Engineering.

Enrolments

Undergraduate

	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017
Full-Time	236	277	231	187	183
Part-Time	47	58	63	69	49

Graduate

	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017
Full-Time	83	82	103	127	159
Part-Time	8	12	10	7	6

Human Resources

Faculty/Instructors

Tenure/tenure-track faculty	17 (including 1 vacancy)
Faculty members involved in graduate program delivery	15

Full/Part-time Staff

Graduate Secretary	1
Engineering Technologist	.5
Technician	1
Technologist	1
Secretary to the Head	1

FINAL ASSESSMENT REPORT (with Implementation Plan)

Significant Strengths of the Programs
The Department of Civil and Environmental Engineering offers quality undergraduate and graduate programs delivered by well-qualified faculty members in a state-of-the-art facility that "creatively combines laboratories for undergraduate study and graduate research activities." (ER, p.2). "The renewable energy laboratory and research activities were noted as particularly innovative along with leading-edge transportation research, and unique environmental research on bio-reactors." (ER, p.3)

Opportunities for Program Improvement/Enhancements
As noted by the External Reviewers, "[the qualifications of the faculty members are strong; most are licensed professional engineers and all have PhDs. Faculty members also generally have good research records with the vast majority holding NSERC Discovery awards. A weakness is the lack of research chairs." (ER, p.5) To this end, the External Reviewers recommended that the Department develop a strategic plan for obtaining research chairs (see recommendation 6 below). In its response to the External Reviewers report, the Department confirmed that this concern will be addressed in its upcoming strategic plan for research and graduate studies. (HR, p.3)

Further opportunities for program improvements are captured in the recommendations listed below.

IMPLEMENTATION PLAN

Recommendations (in priority order)
(Final recommendations arrived at by the Program Development Committee, following a review and assessment of the External Reviewers report, the Head's response, and the Dean's response.)

Undergraduate and Graduate Curriculum Reviews and Learning Outcomes - General

Recommendation 1: That the Department submit:
(a) curriculum maps for each of its programs, program-level learning outcomes for its MEng Civil Engineering and MEng Environmental Engineering *without co-op* programs,
(b) revised learning outcomes for its MASc programs that clearly articulate expectations for research skills, and
(c) course-level learning outcomes, assessment methods and appropriate indicators for learning outcomes, for each of its undergraduate and graduate courses that clearly correspond to the program-level learning outcomes.
Agents: Department Council, Head, CTL, Vice-Provost, Teaching and Learning
Completion by: must be addressed in the 2018/2019 Self-Study Report

Recommendation 2: As part of its curriculum review exercise, that the Department
(a) identify specific initiatives that could be taken to enhance innovation into its programs, thereby providing more distinctive undergraduate and graduate programs.
(b) investigate methods to engage more undergraduate students in research.
(c) compare the NSSE and CGPSS scores for its programs against those achieved by other comparable programs across Canada, to identify strengths and areas for enhancement.
(d) confirm and investigate the apparently high attrition rates, and develop and report on strategies to address attrition.

(e) decide and report on what undergraduate and graduate program quality indicators[1] are most appropriate and start to track them in earnest. This could be achieved similar to the Canadian Engineering Accreditation Board (CEAB) guidelines.
Agents: Head, Dean
Completion by: must be addressed in the 2018/2019 Self-Study Report

Environmental Engineering Undergraduate

Recommendation 3: That the Department embark on a whole-scale curriculum review of the undergraduate Environmental Engineering program, with a view to:
(a) revisiting the feasibility of offering Environmental Engineering as a separate program.
(b) If it is deemed feasible and appropriate to continue to offer Environmental Engineering as a separate program, that the Department develop and report on its plan to enhance recruitment efforts to increase the number of students in Environmental Engineering, either through direct entry into first-year or via transfer agreement or degree completion pathways.
Agents: Department Council, Head
Completion by: must be addressed in the 2018/2019 Self-Study Report

Recommendation 4: That the Department report on its plan to ensure sufficient availability of options for Environmental Engineering students, in scheduling elective and mandatory courses, among and between other departments.
Agents: Head
Completion by: must be addressed in the 2018/2019 Self-Study Report

Undergraduate Co-op

Recommendation 5: That the Department review the current co-op models and work with the Co-op office to address student concerns about the relevance of the types of positions available and increase the number of co-op placements, including introducing a formal one-year internship as an alternative to the current alternate term co-op model.
Agents: Department Council, Head
Completion by: must be addressed in the 2018/2019 Self-Study Report

Graduate Studies and Research

Recommendation 6: That the Department develop and report on its strategic plans for research and graduate studies, as intended, which should include strategies to:
(a) review graduate course offerings to ensure that these courses continue to meet the different expectations of all three graduate degrees (MEng, MASc, PhD).
(b) seek other sources of funding to support its activities (e.g., industry, alumni support, externally-funded chairs), including establishing research teams with a view to obtaining large group grants or industry-sponsored research grants and securing sustainable graduate student funding.
(c) investigate whether research funding is decreasing.
Agents: Department Council, Head, Office of Research Services
Completion by: must be addressed in the 2018/2019 Self-Study Report

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[1] *Perhaps use the following IQAP quality indicators:*
a) Faculty: funding, honours and awards, commitment to student mentoring
b) Students: grade-level for admission, scholarly output, success rates in provincial and national scholarships, competitions, awards and commitment to professional and transferable skills
c) Program: evidence of program structure and faculty research that will ensure the intellectual quality of the student experience
d) Sufficient graduate level courses that the students will be able to meet the requirement that two-thirds of their course requirements be met through courses at this level.

Recommendation 7: That the Department devise and report on its a plan to track the number of publications by graduate students.
Agents: Head
Completion by: must be addressed in the 2018/2019 Self-Study Report

Recommendation 8: That the Department, working with the Faculty Dean and the Dean of Graduate Studies, investigate how it migh**t** increase the number of GAs, especially in the areas of highest demand (student enrolment/need).
Agents: Head, Dean of Engineering, Dean of Graduate Studies
Completion by: must be addressed in the 2018/2019 Self-Study Report

Civil Engineering - Recruitment

Recommendation 9: That the Department develop a diversity and equity strategy to increase the representation of women in the Civil Engineering program, and to ensure recruitment and retention of other equity seeking groups such as visible minorities, Indigenous students, and students with disabilities.
Agents: Head, Departmental Council, Dean
Completion by: must be addressed in the 2018/2019 Self-Study Report

Teaching

Recommendation 10: That the Department consider and report on strategies to enhance the quality of teaching and identify appropriate indicators of quality teaching, which may include student evaluations of teaching.
Agents: Head, Departmental Council, Dean
Completion by: must be addressed in the 2018/2019 Self-Study Report

Recommendation 11: That the Department report on strategies to mitigate plagiarism and cheating and encourage academic integrity.
Agent: Head, Instructors, Academic Integrity and Student Conduct Officer
Completion by: must be addressed in the 2018/2019 Self-Study Report

Human Resources

Recommendation 12: That the Department, working with the Faculty Dean, report on a plan to effectively and efficiently manage human resource needs, including
(a)   reviewing technical staff needs, and
(b)   reducing the number of sessional instructors in the Department. Sessional instructors should be given such support and mentoring as may be necessary.
Agents: Head, Dean
Completion by: must be addressed in the 2018/2019 Self-Study Report

Marketing and Recruitment

Recommendation 13: That the Department, in consultation with the Office of the Vice-President, Research and Innovation, the Dean, and Public Affairs and Communication, design and implement a strategy for improvements to public relations and research dissemination in the popular media, including web-based applications of information and communications technologies.
Agent: Head, Dean, Vice-President, Research, PAC
Completion by: must be addressed in the 2018/2019 Self-Study Report