UTQAP Cyclical Review: Final Assessment Report and Implementation Plan

1. Review Summary

Programs Reviewed:	Civil Engineering, BASc Lassonde Mineral Engineering, BASc Civil Engineering, MASc Civil Engineering, MEng Cities Engineering and Management, MEng Civil Engineering, PhD
Division/Unit Reviewed:	Department of Civil & Mineral Engineering
Commissioning Officer:	Dean, Faculty of Applied Science & Engineering
Reviewers (Name, Affiliation):	1. Prof. James H. Garrett, Jr., PhD, Dean, College of Engineering, Carnegie Mellon University 2. Prof. Amit Kanvinde, PhD, Chair, Department of Civil and Environmental Engineering, University of California, Davis 3. Prof. Kimberly Kurtis, PhD, Interim Head, Department of Civil and Environmental Engineering, Associate Dean of Faculty Development and Scholarship, Georgia Tech 4. Prof. Erik Westman, PhD, Department Head, Department of Mining and Minerals Engineering, Virginia Tech
Date of Review Visit:	March 14 – 15, 2018

Previous Review

Date: 2012

Summary of Findings and Recommendations

1. Undergraduate Programs

The reviewers observed the following strengths:

- Civil Engineering benefits from "excellently qualified" students, dedicated faculty and staff, and growing student interest

The reviewers identified the following areas of concern:

- Students expressed some concerns with curriculum (too broad, not enough integrative/elective options, too many introductory courses for sub-disciplines; see new courses as ad hoc rather than guided by learning objectives) and would like more input into changes
- Lack of belonging for Lassonde Mineral Engineering students; small number of Lassonde Mineral Engineering courses

The reviewers made the following recommendations:

- Consider engaging in curriculum review/reform

2. Graduate Programs

The reviewers observed the following strengths:

- Civil Engineering at University of Toronto ranked generally among the top ten in North America and is the best in Canada in various international rankings
- Excellent quality students

The reviewers identified the following areas of concern:

- Most students take 5+ years to graduate but four year funding commitment

The reviewers made the following recommendations:

- Increase number of PhD graduates and reduce times to completion

Faculty/Research

The reviewers observed the following strengths:

- High ranking reflects quality of faculty research efforts and longstanding commitment to establish and retain strength in specific research areas

The reviewers identified the following areas of concern:

- No faculty mentoring guidelines

- Junior faculty find lack of clarity regarding expectations for promotion and tenure
- Little collaboration between research groups

The reviewers made the following recommendations:

- Develop faculty mentoring guidelines to support junior faculty
- Prepare for shift of funding towards more applied and industry driven research

Administration

The reviewers observed the following strengths:

- Collegial, social environment with good teamwork

The reviewers identified the following areas of concern:

- Lassonde Mineral Engineering program not well integrated into the department; unclear management model for and relationship between Lassonde Mineral Engineering and Civil Engineering

The reviewers made the following recommendations:

- Improve department communications
- Better integrate Lassonde Mineral Engineering

Last OCGS review date: 2007/08

Current Review: Documentation and Consultation

Documentation Provided to Reviewers

- CVs of Civil and Mineral Engineering Faculty
- FASE Academic Plan, 2017-2022
- FASE Annual Report, 2017
- FASE Undergraduate Calendar, 2017-2018
- Itinerary
- Review Report Template
- Self-Study
- Terms of Reference
- U of T Graduate Calendar, 2017-2018
- U of T Quality Assurance Process
- U of T Towards 2030 – Synthesis
- U of T Towards 2030 – View from 2012 (Progress Report)

Consultation Process

The Committee met with the following persons/groups:

- Dean Cristina Amon
- Vice-Deans of Graduate Studies, Undergraduate Studies and Research
- Civil and Mineral Engineering Department Chair Brent Sleep
- Associate Chairs/Former Associate Chairs/Staff related to Undergraduate Studies
- Associate Chairs/Staff related to Graduate Studies
- Associate Chair for Research
- Pre-tenure Professors in the Department
- Tenured Professors in the Department
- Senior Leadership of the Administrative Staff
- Department Administrative and Technical Staff Members
- Undergraduates in the Civil Engineering and Lassonde Mineral Engineering Programs
- Graduate Students in the Civil Engineering Program
- Chairs and Directors of other Departments and Institutes in the Faculty of Applied Science & Engineering
- The Advisory Search Committee for the Chair of the Department of Civil and Mineral Engineering

Current Review: Findings and Recommendations

1. Undergraduate Program

The reviewers observed the following **strengths:**

- Overall quality
    - Highly-regarded undergraduate programs that attract the best students in these disciplines
- Objectives
    - Programs shaped by the visions of the University, Faculty, and the department
- Admissions requirements
    - Admissions process is conducted at the Faculty level, allowing some level of control over the caliber of student accepted into the department
- Quality indicators
    - Student evaluations show that the teaching effectiveness is marginally higher than the Faculty average
    - High quality students admitted at undergraduate and graduate levels
    - Quality of undergraduates admitted into the Lassonde Mineral Engineering (LME) program has improved significantly over the past ten years and is now approximately equivalent to that of the Civil Engineering (CE) program
- Students

    - Excellent gender diversity

The reviewers identified the following **areas of concern**:

- Curriculum and program delivery
    - Student workload is excessive, making it hard for them to consume the material effectively
    - Varying quality of TAs, with further differences between CE and LME students; faculty teaching quality also varies to a lesser degree
    - Number of redundant courses (e.g., Geotechnical Engineering I and II)
    - Students would like to take more electives earlier in their curriculum
    - Students expressed concern that the department was not receptive to some of the curricular issues they had identified, including course offerings in the Lassonde Mineral Engineering program, the obligatory breadth of the curriculum, and obtaining design capstone projects

The reviewers made the following **recommendations**:

- Curriculum and program delivery
    - Review the CE and ME curricula as part of a larger strategic planning effort
    - Streamline offerings, remove redundancies, and increase flexibility
    - Allow students to take electives earlier
    - Provide TAs with more training so they are consistently good resources for the students
- Enrolment
    - Continue to reduce the size of the undergraduate enrolment while increasing the number of doctoral students
- Students
    - Continue to diversify the student population, especially traditionally underrepresented groups

2. Graduate Program

The reviewers observed the following strengths:

- Quality indicators
    - MEng, MASc, and PhD programs in Civil Engineering have strong applications and growing enrolments
- Students
    - High quality students with excellent gender diversity

The reviewers identified the following areas of concern:

- Curriculum and program delivery
    - MEng in Cities Engineering and Management is not as robust as it could be
- Student funding

    - Students concerned about lack of transparency regarding funding, impacting the morale of some students
    - Appearance of inequity between groups in terms of office space and lab/technical support

The reviewers made the following recommendations:

- Curriculum and program delivery
    - Set a deadline for evaluation and decision regarding the future of the MEng in Cities Engineering and Management; determine whether to market it much more aggressively or cease to devote resources to it
- Enrolment
    - Reduce undergraduate enrolment while growing the PhD program

3. Faculty/Research

The reviewers observed the following **strengths**:

- Research
    - Very good faculty engagement in research at all ranks
    - Research addresses both fundamental topics and emerging challenges with a common goal "to serve as stewards of the environment to ensure a safe, healthy and sustainable future"
    - Department's research aligns well with the Faculty's broad themes of research innovation in water, sustainability, and artificial intelligence or machine learning
    - Breadth in faculty research activities derives from the size of the program, collaboration within the department (particularly within disciplines), and through collaboration with other departments
    - Doubled research funding over the past five years
    - Annual research expenditure per faculty is the best among Canadian Civil Engineering-oriented departments
    - Grants come from a diversity of sources including the Canadian and Ontario governments and industry, with a general upward trend in funding
    - Faculty involvement in research contributes to their ability to deliver state-of-the-practice and emerging technologies in the classroom
- Faculty
    - Department has been able to hire and retain a technically-excellent and diverse group of research-oriented faculty, with only a few faculty departures in recent years and those attributed to faculty seeking leadership roles at other institutions or due to retirement
    - Faculty has grown significantly (16% in five years), presenting new opportunities for research and raising the department's national and international profile
    - Increase in faculty diversity has been a priority with significant increases in gender diversity

    - Faculty feel that the culture is very welcoming and collegial
    - Cross-appointed faculty members are very pleased with their dual appointments
    - Faculty appear to be energized by their research, supported by both the quality of the students and world-class facilities
    - Faculty appear to be well-engaged in research, education, and internal service
    - All faculty recognize the professional caliber of their peers, and the excellence of their students, staff, and facilities
    - Junior faculty have autonomy to pursue their own research and teaching agendas with department support

The reviewers identified the following **areas of concern**:

- Research
    - Corporate funding for research appears to be relatively consistent to slightly downward trending
- Faculty
    - Lab space and equipment needs of pre-tenure faculty are not being recognized and addressed by senior faculty members, with delays of up to five years
    - Information about how to get tenure comes from word of mouth and isn't written down, causing angst and uncertainty for pre-tenure faculty, and untenured faculty expressed some uncertainty about the structure of the tenure materials
    - Lack of established processes for performance appraisal and feedback
    - Some groups appear to be more influential than others, leading to real or perceived inequities in resource allocation, with a potential impact on morale

The reviewers made the following **recommendations**:

- Research
    - Increase engagement in industry-sponsored research to contribute to scholarship and education and provide another opportunity to facilitate student understanding of the engineering practice, as well as their placement in internships and in jobs after graduation
    - Explore the development of structures to support and facilitate undergraduate student engagement in research and their access to facilities (e.g., maker spaces)
    - Identify and renovate or specialize, as required, research space prior to new faculty arrival on campus, accelerating the rate of scholarly productivity in early career faculty
    - Support the growth of collaboration across departments and within departmental research areas to contribute to research innovation and relevance
- Faculty
    - Create a culture which prioritizes mentoring junior faculty and providing detailed and formal annual feedback from the PTR committee
    - Formally document and communicate the expectations of PTR processes

    - Provide on-boarding programming, such as LAUNCH, to ensure the pre-tenure faculty know of, and have a chance to ask questions about, PTR processes and policies
    - Strengthen linkages across groups of faculty and incentivizing cross-group collaborations to accelerate interdisciplinary research and foster collegiality.

4. Administration

The reviewers observed the following **strengths**:

- Relationships
    - Department members are invested in the success of their peers and the department
    - Students have strong camaraderie and were appreciative of the opportunities provided to them
    - Strong individual faculty research collaborations with other institutions and collaboration between faculty within the same discipline
    - Joint faculty appointments facilitate interdisciplinary collaboration
- Organizational and financial structure
    - Under the current chair, graduate enrolments have risen, the faculty has grown and become more diverse, and the budget has become much more healthy
    - Senior faculty feel that the department provides many state-of-the-art and best-in-country laboratory facilities in structures, materials characterization, transportation, geochemical microbiology, and environmental engineering
    - Department Council is effective in developing academic policy
- Planning/vision
    - Current academic situation is sound and forms an excellent foundation for future growth
    - In an ideal geographic location for sustained, continual growth
    - Department is mature and has an excellent mix of expertise and experience providing solid, long-term platform
    - Self-study document is an excellent and thorough tool on which the planned strategic plan can be developed
- Reputation/profile
    - Well-deserved ranking as the top Civil Engineering department in Canada
    - Ranking demonstrated by impressive rates of faculty funding from prestigious competitive sources, recognition of scholarship through international awards, and high rates of citation

The reviewers identified the following **areas of concern**:

- Relationships

    - Students, staff and faculty consistently expressed the need for more formally documented and communicated policies and procedures (e.g., curricular expectations, tenure process, sick leave, etc.)
    - Chairs from other departments in the Faculty indicated their desire for increased collaborations with Civil & Mineral Engineering
    - Evidence of concerted alumni engagement was sparse, and plans for future engagement are not clear
- Organizational and financial structure
    - Significant concerns regarding space quality and allocation and lack of high-level sense of what and how much space is needed
    - Space decisions are not all transparent for faculty, staff and students
    - Faculty, staff and graduate students felt there was not sufficient space for graduate students
    - Serious understaffing problems:
        - morale and productivity are negatively impacted
        - number and distribution of staff has not kept pace with student and faculty growth, and staff are stretched beyond capacity in student advising, lab tech support, IT support, and financial management
        - unclear if there is a staffing plan
        - one senior IT position vacant (search under way for several months), Director of Technical Services on leave, two administrative vacancies in the Department Business Office
    - Director of Technical Services was on leave and senior IT position was vacant, causing delays for junior faculty in setting up their laboratories
    - Job descriptions and duties are unclear, resulting in excessive responsibilities
    - Staff are not reviewed or given performance-improving feedback
    - Currently four associate chairs
- Planning/vision
    - Lack of a strategic plan
- Reputation/profile
    - No current identification of international peers

The reviewers made the following **recommendations**:

- Relationships
    - Strengthen cross-group relationships (especially among junior faculty) by incentivizing collaborations
    - Increase alumni and external stakeholder engagement through restructuring of advisory boards, and more visible marketing, communications, and outreach
- Organizational and financial structure
    - Conduct a space audit will enable the department to more effectively advocate for space and take advantage of financial incentives for optimal space usage
    - Form of a space committee to develop a strategic plan for space and procedures for allocation

    - Conduct a major review of staff needs and gaps, staff structure, job descriptions and performance review and feedback processes
    - Fill vacant positions and increase laboratory and IT staffing to support growing needs in education and research
    - Create a Department Manager or Chief Operations Officer position that oversees all staff and reports to the Chair will increase efficiency of staff, and alleviate anxiety by providing clarity regarding job expectations and performance
    - Establish formal and regular communication channels, e.g., standardized performance review protocol
    - Consider having fewer Associate Chairs and grooming one or two that are mid-career faculty to serve as future department Chair
    - Develop of an "access point" repository of current policy documents, and meeting minutes on all matters of governance
    - Manage of fluctuating budgets at the Faculty, rather than department, level
- Planning/vision
    - Include all constituencies in the creation of a strategic plan
    - Evaluate the departmental mission statement
- Reputation/profile
    - Identify aspirational peers that embody achievable goals for the programs within the next ten years, including comparing a variety of metrics to other top programs

2. Administrative Response & Implementation Plan

UNIVERSITY OF TORONTO
FACULTY OF APPLIED SCIENCE & ENGINEERING

February 20, 2019

Professor Susan McCahan
Vice-Provost, Academic Programs
University of Toronto

Dear Professor McCahan

I write in response to your letter of August 7, 2018 regarding the March 14-15, 2018 external review of the recently-renamed Department of Civil and Mineral Engineering and its undergraduate and graduate programs.

The external review process is a valuable exercise that affords us the opportunity to take stock of the state of our academic units and of the Faculty as a whole. We are extremely pleased with the reviewers' positive assessment of the overall strength of the department, particularly the excellent quality and diversity of our students and faculty, highly-regarded undergraduate and graduate programs, and increased research funding.

Below I address the issues raised by the reviewers and outlined in your request for an administrative response.

Administration

1. The reviewers indicated there is a need for an overarching departmental strategic plan, which may include an overall mission statement, address undergraduate and doctoral enrolment, and identify international peer institutions.

The Department has embarked on consultative processes with stakeholders to develop an overarching departmental strategic plan. The strategic plan, building on outcomes of the self-study and external review report, will be consistent with the Faculty of Applied Science and Engineering (FASE) *2017-2022 Academic Plan* and *Implementation Plan*, the *University of Toronto Strategic Research Plan* and the *Three Priorities of the University*. The Department has established a Strategic Planning Working Group, consisting of the Chair, four Associate Chairs, and two Directors from the Department.

Immediate-term goals (within six months)

- Develop terms of reference for the Strategic Planning Working Group
- Consult with Department stakeholders (faculty, staff, students, alumni, Industrial Advisory Board)
- Conduct a Department retreat (June 2019)
- Survey best practices of international peer institutions

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Mid-term goals (within one to two years)

- Complete the draft strategic plan and circulate it for feedback (July 2019)
- Finalize the strategic plan (September 2019)

Long-term goals (within three to five years)

- Review progress made towards the strategic plan's goals, adjust priorities to ensure continued progress, and refine objectives

2. The reviewers identified variances in the quality and quantity of space available to faculty and students and in communication about decisions regarding space. The reviewers recommended establishing a "Space Committee" to establish a strategic space plan and to seek ways to improve communications surrounding space decisions.

Since 2012, nine new faculty members have joined the Department and one faculty member has retired. The number of PhD students has increased from 96 to 110 and the number of post-doctoral fellows and research associates has also grown. This has placed tremendous pressure on office space. Demands for research space have also grown with more faculty, more students, and increases in research funding. Over this period the Department has invested approximately $7M in lab and office space renovations in the Galbraith and Lassonde Mining buildings and has acquired additional research and graduate student office space. This has included an additional 60 office spaces for graduate students in the Galbraith and Lassonde Mining buildings. The Student Services team has moved to space recently acquired from the FASE, providing space for the expanded IT and Infrastructure personnel in the Department. A number of graduate student offices have been updated with new furniture and been repainted. Renovations with SIF funding have refurbished or created research space in the areas of mining and environment, low impact development, geotechnical engineering, and concrete materials. During the renovation period in 2017 and 2018 there was significant disruption of research programs. In May 2019, the Department will acquire additional office space from the FASE.

Through a consultative process, the Department developed a space policy in 2015. The allocation of graduate student office space is overseen by a Space Management Committee comprised of the four Section Coordinators in the Department with support from the Department Infrastructure Assistant. While within its mandate, this Committee has not been involved in allocation or reallocation of research space. With new faculty members and research programs of more junior faculty members expanding at different rates, there is a need to review the allocation and effectiveness of the current research space distribution within the Department. This review will be led by the new Director of Technical Services (hired in January 2019) with a newly constituted space committee focused on both research lab and graduate student office space allocation. This committee will engage relevant stakeholders in any consideration of space allocations and report any deliberations and decisions on space allocations at Departmental Council meetings.

Immediate-term goals (within six months)

- Hire Director of Technical Services (completed January 2019)
- Review and revise the mandate of the Department Space Committee
- Review the quality and quantity of graduate student office space
- Review the needs for and allocation of research space

Mid-term goals (within one to two years)

- Follow up on space reviews to optimize office and research space usage, prioritizing needs of junior faculty
- Develop a plan for the renewal of office and research space
- Work with Advancement to identify philanthropic opportunities for research space renewal

Long-term goals (within three to five years)

- Conduct regular reviews of space needs, allocation and usage, and communicate the outcomes
- Continue to work with Advancement in seeking funding for space renewal and new space needs

3. The reviewers encouraged the Department to formalize administrative processes and to improve communications surrounding staff job expectations and performance review. They also recommended conducting a review of needs, gaps, and workload within the staffing structure, especially in the areas of IT and lab support staff.

Performance reviews for USW staff, Research Associates, and Professional Managers are conducted following the administrative processes set out in the University of Toronto policies and collective agreements. Job descriptions of a number of Departmental staff have been reviewed and updated as needs and expectations changed.

The Department's 2018 Self-Study identified a number of needs, gaps and workload issues within the staffing structure. Since the external review, two additional people have been hired in the Department Business Office. An additional position will be created to provide greater support to faculty members in managing the finances and contracting associated with large government and industry funded research projects. This position should be filled by April 2019.

A new Director of Technical Services was hired in January 2019. This person oversees all technical staff in the Department and is also responsible for health and safety and management of space and research and teaching infrastructure in the Department. A new position, Departmental Assistant, has been created and will be filled by March 2019. This person will report to the Director of Technical Services and assist with management of space and infrastructure and scheduling of IT support.

A new Computer Network Manager was hired after completing a year-long search and engagement of an external search agency. This person works with the Department Computer Assistant. A summer IT assistant was also hired and we will be engaging a work study student to assist with IT. With a pending retirement, we anticipate hiring a new Computer Assistant in 2019. The Department also supports the sharing of IT resources across the FASE, as per recommendations of the FASE IT Taskforce.

With respect to lab support, the Department has the following support staff:

- Three full-time technical staff supporting the Structural Test Facility and research and teaching in the structures and concrete materials area
- One full-time machinist supporting research and teaching needs across the Department
- One full-time laboratory technician supporting undergraduate and graduate teaching for environmental courses and monitoring safety in the environmental research labs
- One full-time technician supporting teaching and research in the geotechnical and geomechanics areas

At present, cost recovery from the technical staff for work associated with research projects accounts for approximately 40% of the salary and benefit costs.

Regular town hall meetings with staff were initiated in August 2018.

Immediate-term goals (within six months)

- Continue to maintain regular communications with staff through town halls
- Review current workloads and identify possibilities for efficiencies and needs for additional positions
- Create a Business Office position associated with research support

Mid-term goals (within one to two years)

- Continue to maintain regular communications with staff through town halls
- Review workloads and job descriptions and allocations of duties on an annual basis
- Anticipate changes in staff workloads
- Develop on-boarding materials for new staff

Long-term goals (within three to five years)

- Continue to evaluate Department needs, staffing, and workloads

Faculty

4. The reviewers noted gaps in mentorship and feedback surrounding faculty promotion. The reviewers recommended improving the documentation and communications for tenure expectations, and prioritizing untenured faculty space, resources and feedback.

Mentors are assigned to new faculty members when they join the Department. Mentors are asked to provide a yearly update to the Chair on their mentoring activities. A teaching mentor is also hired for all new faculty members to provide guidance through their first teaching assignment. The Department Chair meets annually with all assistant professors to review and discuss assessments conducted by the Department PTR Committee. When possible, a junior faculty member is invited to be a member of the PTR Committee each year. Research proposals of junior faculty are reviewed by the Associate Chair of Research in the Department.

As per University policy, probationary reviews for assistant professors are held in their fourth year at the University and the recommendations of the Probationary Review Committee are communicated to these professors by the Department Chair.

Immediate-term goals (within six months)

- Chair will meet with junior faculty to discuss promotions policies and expectations
- Chair will continue meeting with junior faculty as part of the annual PTR assessment

Mid-term goals (within one year)

- Develop on-boarding materials for new faculty
- Ensure junior faculty space and resource needs are prioritized and met within the Department constraints on space and resources
- Chair will continue to meet regularly with junior faculty, including meetings to discuss PTR assessments
- Continue to have junior faculty on the Department PTR Committee

Long-term goals (within two to five years)

- Continue to ensure junior faculty space and resource needs are prioritized and met within the Department constraints on space and resources
- Chair will continue to meet regularly with junior faculty
- Continue to have junior faculty on the Department PTR Committee

Undergraduate Programs

5. As part of the strategic plan, the reviewers recommended conducting a curriculum review to identify curricular overlap and to address student workload.

The Civil Engineering and Lassonde Mineral Engineering programs are undergoing review by the Canadian Engineering Accreditation Board (CEAB), with accreditation decisions expected in June 2019. Preparation for the October 2018 visit required curriculum mapping and explicit identification of learning outcomes for courses in these programs. Through this process, action items related to current curricula were identified. The goals listed below are consistent with the CEAB requirement for a continuous curriculum improvement process.

Immediate-term goals (within six months)

- Hold town halls with students to collect feedback on the current curricula
- Establish committees to map out a plan for curriculum review. These committees will report to the Department Undergraduate Studies Committee
- Address any concerns raised by the CEAB

Mid-term goals (within one to two years)

- Identify any curricular overlap and student workload issues
- Identify new opportunities and directions in the relevant professions (e.g. data science in civil and mineral engineering professions)
- Complete curriculum review and pass it through the FASE governance process

Long-term goals (within three to five years)

- Review curriculum and CEAB graduate attributes in the continual improvement process on an ongoing basis
- Review curriculum to ensure its relevancy regarding current directions in the engineering profession

6. The reviewers encouraged continuing to recruit students from traditionally underrepresented groups.

The 2018 first year Civil Engineering class is 44% women and 32% of the class are international students. The first year Lassonde Mineral Engineering class is 23% women and 10% of the class are international students. The second year Civil Engineering class is 50% women. We will continue efforts to maintain this level of gender diversity in the Civil Engineering program and increase the level of gender diversity in the Lassonde Mineral Engineering program through participation in FASE recruitment events, our annual Top Applicant Event, and other activities such as the Women in Mining events.

We will also work with the FASE to increase representation from Indigenous, Black, and other communities underrepresented in the Department's graduate and undergraduate

programs. We will consider the recommendations from the Eagles Longhouse Blueprint for Action report and participate in Black Inclusivity Initiatives led by the FASE.

Immediate-term goals (within six months)

- Continue our successful efforts in increasing gender diversity in our graduate and undergraduate programs
- Work with the FASE to increase representation from Indigenous, Black and other underrepresented communities
- Participate in FASE outreach and programming efforts to strengthen relationships with underrepresented communities

Mid-term and long-term goals (within one to five years)

- Maintain efforts to increase gender diversity and representation from Indigenous, Black and other underrepresented communities
- Identify opportunities to incorporate indigenous content into the CIV and LME curriculum

Graduate Programs

7. The reviewers suggested reviewing the promotion and enrollment for the MEng in Cities Engineering and Management, and evaluating the overall future direction for the program.

The MEng in Cities Engineering and Management (MEngCEM) was launched in September 2013. The 16-month full-time program will continue the trend towards broadening engineering education and cross traditional engineering disciplines to focus on the application domain of cities. The program is structured around three themes: Theme A: infrastructure-related courses that focus on quantitative methods to provide a foundation for evidence-based decision making; Theme B: cities as complex systems that influence decision making; and Theme C: an integrative practicum that allows students to apply the technical knowledge they have learned to a complex problem related to cities.

To date, enrolment in the MEngCEM has remained relatively small. In the 2018-2019 academic year, there were 47 applications to the program. From these applications, 19 students were offered admission and 10 students accepted the offers. While the program is given significant exposure on the Department website, it is clear that additional efforts are needed to increase enrolment. An initiative is underway to create a mentorship program for MEngCEM students with the City of Toronto and the City of Oshawa has expressed interest in providing practicum placements.

Immediate-term goals (within six months)

- Survey past graduates on impact of the program on their careers, advice for revision of program structure and program curriculum
- Appoint a director

- Form an advisory group
- Review the program's curriculum
- Pursue internship possibilities with City of Oshawa and interested companies (e.g. WSP, PCL Construction)

Mid-term goals (within one to two years)

- Evaluate the impact of the immediate-term actions

Long-term goals (within three years)

- Assess whether to close the program

Research

8. The reviewers encouraged expanding the Department's research portfolio by exploring more industry-sponsored research for students; identifying ways to support undergraduate research engagement; and, supporting growth in cross-departmental research.

In 2016, 9.4% of the Department's $8.5M in research funding was derived from industry sources. Over the past five years, graduate and undergraduate students in the Department have been involved in research supported by funding from 63 companies. Students have participated in industrial internships through the NSERC Industrial Postgraduate Scholarship Program, the Mitacs Accelerate Program, and NSERC Collaborative Research and Training Experience Programs.

Each summer, undergraduate students work in the Department with various research groups, particularly in research labs. Some students are supported by NSERC Undergraduate Summer Assistantships and from the research funds of faculty members.

As of January 2019, the Department has four budgetary faculty cross-appointments with other units in the Faculty. In addition to these cross-appointments, many faculty in the Department actively collaborate on research projects across the FASE and beyond. A number of the projects are supported by funding from the FASE and the Department (six XSeed projects for example, each supported by $15K/yr. from the Department). Faculty members in the Department are involved in several extra-departmental institutes including the Institute for Water Innovation, the University of Toronto Transportation Institute, the Institute for Sustainable Energy, and the Lassonde Institute of Mining. Cross-departmental and cross-faculty research has been supported by various NSERC programs (e.g. Strategic Project Grants, Collaborate Research and Training Experience Program), the Ontario Research Fund Research Excellence program, and by industry funding. We are creating a new position in the Department Business Office to support faculty who manage large and complex cross-departmental and interdisciplinary research projects.

Immediate-term goals (within six months)

- Create and fill new Business Office position associated with research support
- Ensure undergraduate students are aware of research-related summer employment in the Department
- Continue to work with the FASE Director of Corporate and Foundation Partnerships to pursue industry funding for departmental and cross-departmental research
- Continue to engage the Department Industrial Advisory Board and the Lassonde Advisory Board

Mid-term and long-term goals (over the next five years)

- Continue outreach to industry for support of departmental and cross-departmental research projects
- Explore funding to increase the engagement of undergraduates in research

Relationships

9. The reviewers suggested increasing alumni and external engagement in advisory boards and improving outreach activities to these groups.

The Department supports the Engineering CONNECT alumni platform with more than 1,000 alumni signed up to CONNECT. The Department is working with FASE Advancement to increase alumni engagement.

Immediate-term goals (within six months)

- Expand the Industrial Advisory Board (IAB) by two members
- Hire Communications and Event Assistant
- Continue to encourage sign-ups to CONNECT
- Hold Skule™ Lunch and Learn sessions on topics relevant to the Department, with targeted invitations
- Begin Gull CAMP bunkhouse construction ($3.2M project approved by the Capital Projects and Space Allocation Committee in February 2019)

Mid-term goals (within one to two years)

- Continue to expand the Department Industry Advisory Board (IAB) to 10 – 12 members, focussing on diversity
- Identify candidates for FASE alumni awards
- Work with Advancement to develop annual plans for alumni engagement events

Long-term goals (within three to five years)

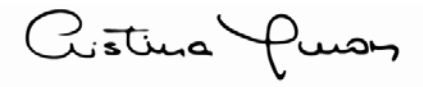
- Renew IAB (members have initial three-year term) and further expand it to 15 members, focussing on diversity
- Form IAB subcommittees to focus on various Department priorities

The next review of the Department of Civil and Mineral Engineering and its programs is scheduled for the 2022-2023 academic year. In the interim, the chair of the department, Professor Brent Sleep, will report to the Dean on progress made toward the implementation of recommendations on an annual basis, and the Dean will submit a report to you in the 2020-2021 academic year, midway between the March 2018 review and the next site visit.

I confirm that Professor Sleep and I will attend the April 2, 2019 AP&P meeting, where this review will be discussed.

Thank you for the opportunity to respond to the report of the external review team. Their comments and recommendations have helped sharpen the vision and future priorities for the Department of Civil & Mineral Engineering.

Sincerely



Cristina Amon
Dean

cc:

Justine Garrett, Coordinator, Academic Planning and Reviews
Professor Heather MacLean, Acting Chair, Department of Civil and Mineral Engineering
Daniella Mallinick, Director, Academic Programs, Planning and Quality Assurance
Professor Brent Sleep, Chair, Department of Civil and Mineral Engineering
Caroline Ziegler, FASE Governance and Programs Officer

3. Committee on Academic Policy & Programs (AP&P) Findings

At its meeting on April 2, 2019, the Committee on Academic Policy and Programs (AP&P) concluded that the Decanal response adequately addressed the review recommendations.

4. Institutional Executive Summary

The reviewers praised the high quality of students and were impressed by the gender diversity of the student body. The reviewers highlighted the strong level of faculty research funding, which has doubled over the last five years. Overall, the reviewers were very complimentary and felt the department was deserving of its reputation as the top civil and mineral engineering department in Canada. The reviewers recommended that the following issues be addressed: developing an overarching departmental strategic plan, possibly including an overall mission statement; addressing undergraduate and doctoral enrolment; identifying international peer institutions; addressing variances in the quality and quantity of faculty and student space; improving communication about decisions regarding space; developing a strategic space plan; formalizing administrative processes and improving communications surrounding staff job expectations and performance review; conducting a review of needs, gaps, and workload within the staffing structure, especially in the areas of IT and lab support staff; addressing gaps in mentorship and feedback surrounding faculty promotion; improving the documentation and communications for tenure expectations, and prioritizing untenured faculty space, resources and feedback; conducting a curriculum review to identify curricular overlap and to address student workload; continuing to recruit students from traditionally underrepresented groups; reviewing promotion and enrollment for the MEng in Cities Engineering and Management, and evaluating the overall future direction for the program; expanding the department's research portfolio by exploring more industry-sponsored research for students; identifying ways to support undergraduate research engagement; and increasing alumni and external engagement in advisory boards and improving outreach activities to these groups. The Dean's Administrative Response describes the Faculty, unit and programs' responses to the reviewers' recommendations, including an implementation plan for any changes necessary as a result.

5. Monitoring and Date of Next Review

The next review of the Department of Civil & Mineral Engineering and its programs is scheduled for the 2022-2023 academic year. In the interim, the chair of the department will report to the Dean on progress made toward the implementation of recommendations on an annual basis, and the Dean will submit a report to the Vice-Provost, Academic Programs in the 2020-2021 academic year, midway between the March 2018 review and the next site visit.

6. Distribution

On May 17, 2019, the Final Assessment Report and Implementation Plan was posted to the Vice-Provost, Academic Programs website and the link provided by email to the Dean of the Faculty of Applied Science & Engineering, the Secretaries of AP&P, Academic Board and

Governing Council, and the Ontario Universities Council on Quality Assurance. The Dean provided the link to the Chair of the Department.