

FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review

Civil Engineering – Graduate Programs

Date of Review: April 24th and 25th

In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the graduate programs delivered by Civil Engineering. This report identifies the significant strengths of the program, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.

The report includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the Final Assessment Report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

Executive Summary of the Cyclical Program Review

The Civil Engineering program submitted a self-study to the School of Graduate Studies March 2017. The self-study presented the program descriptions and learning outcomes, an analytical assessment of these two programs, and program data including the data collected from a student survey along with the standard data package prepared by the Office of Institutional Research and Analysis. Appended were the CVs for each full-time faculty member in the Department.

Two arm's length external reviewers and one internal reviewer were endorsed by the Dean of the Faculty and selected by the Vice-Provost and Dean of Graduate Studies. The review team reviewed the self-study documentation and then conducted a site visit to McMaster University on April 24th and 25th, 2017. The visit included interviews with the Provost and Vice-President (Academic); Vice-Provost and Dean of Graduate Studies, Dean of the Faculty, Chair of the department and meetings with groups of current students, faculty and support staff.

- **Strengths**

- The review team noted the enthusiasm exhibited by all members of the Department
- Faculty members seem to be keen on collaborating with each other – both in terms of research within a specific area as well as cross-disciplinary research
- Students emphasized the existence of community spirit and camaraderie among them

- **Areas for Enhancement or Improvement**
 - A limited number of enhancements/improvements were suggested by the review committee, which have been listed as recommendations in the table below.

Summary of the Reviewers’ Recommendations with the Department’s and Dean’s Responses

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
<p>ADL space and some of the equipment needs to be modernized – this is the area where a large CFI grant may be most feasible in the next few years.</p> <p>During the tour of the ADL, the review team noted that there is an equity issue in terms of the female users not having access to lockers and showers, which are located inside the men’s changing area. The female graduate students also pointed out this issue to the review team.</p>	<p>Chair to discuss with the Associate Dean – Research about large institutional funding opportunities including CFI to address equipment and space needs and equity issues.</p>	<p>Department Chair</p>	<p>Over next 12 months with continuing evaluation of progress.</p>
<p>Transportation theme (field) does not have a critical mass, although it is noted that two hires are underway. It is not yet clear what the emphasis for this theme will be and the department should consider carefully how to define or position it. This area was described to the review team as “smart mobility”, but how they position</p>	<p>An updated departmental hiring plan, which will include the potential to add new faculty members to achieve critical mass in this vital area, will be prepared and discussed with the Dean.</p>	<p>Department Chair</p>	<p>Over next 12 months with continuing evaluation of progress.</p>

should be re-considered as new faculty are hired.			
The water and environmental theme is small but appears to be close to critical mass, with diverse (modeling to experimental) expertise. The lab is of good quality with a good size; and the research is sustainable and heading in the right direction. The curriculum needs to be revisited to reflect the expertise and research directions of the new hires.	<p>1. An updated departmental hiring plan, which will include the potential to add a new faculty member to achieve critical mass in this area, will be prepared and discussed with the Dean.</p> <p>2. Water and environmental research group will meet to discuss current graduate course offered.</p>	Department Chair / Water and environmental research group	Over next 12 months with continuing evaluation of progress
The geotechnical theme has not (yet) been renewed. This theme will not sustain or enhance the graduate program in the future without such renewal.	The geotechnical research group will meet to identify renewal opportunities and develop renewal strategy. An updated departmental hiring plan, which will include the potential to add new faculty members, will be prepared and discussed with the Dean.	Department Chair / Geotechnical research group	Over next 12 months with continuing evaluation of progress
There appears to be a general lack of professional development opportunities for graduate students, who seem to be quite keen for such opportunities to be made available to them. The Department should consider requiring its graduate students to undergo some professional	<p>Students enrolled in the program after 2015 complete a career development workshop and report.</p> <p>All graduate students will be reminded of the resources and programs offered through graduate studies.</p> <p>An email instructing</p>	Department Chair	Over next 12 months with continuing evaluation of progress

<p>development with respect to oral and written communication and give them more opportunities to test their communication skills. The students found that to be missing when they prepared for and got feedback from their annual Department Seminar Day.</p>	<p>the Graduate Advisor to place additional emphasis on providing feedback on communication skills in the Grad Seminar Day.</p>		
<p>The 20-month MAsC is almost never completed in the stipulated 20-month period. Most students took about 24 months to completion. The Department should consider either making this a fully funded 24-month program or reduce the thesis expectations such that students can regularly complete the program in 20 months.</p>	<p>Graduate Affairs committee will investigate various funding period alternatives and thesis expectation levels. These will be presented to the department in order to identify a suitable funding period/ thesis expectation level combination.</p>	<p>Graduate Affairs Committee/ Department Chair</p>	<p>Over next 12 months with continuing evaluation of progress</p>
<p>The review team found it difficult to understand the distinction between the MEng and the MAsC programs, particularly given how different it is from the other MEng programs within the Faculty of Engineering and at other engineering graduate programs in Ontario. The Department should consider bringing its MEng program in line with other MEng programs in the</p>	<p>Currently investigating a joint professional MEng program with SEPT. Representative(s) from the department will be selected to work with their counterpart(s) in SEPT to determine the viability of a joint program.</p>	<p>Department representative(s)/ Department Chair</p>	<p>Over next 12 months with continuing evaluation of progress</p>

province.			
The review team noted that the graduate office space is a challenge for the Department, which could be limiting for any plans for its future growth.	This issue will be discussed with the Dean's Office, in the context of lab space, TA resources, technician resources and other constraints.	Department Chair	Over next 12 months with continuing evaluation of progress
The review team feels that the technical support for the Graduate Program is inadequate. Although the technicians appear to be of high quality, recent (and planned) growth in the undergraduate program has made research support for graduate students to be inadequate during periods of high undergraduate lab usage.	Ongoing discussions will continue on this issue with the Dean's Office, in the context of lab space, TA resources, technician resources and other constraints.		Over next 12 months with continuing evaluation of progress

Faculty Response:

The reviewers in their assessment of the Department of Civil Engineering found a growing department with an eye on innovation through several major interdisciplinary research initiatives, funded by recent successes in the CREATE and CFREF programs. The graduate experience has been greatly improved by re-work of key methods of evaluation, such as comprehensive exam procedures, though the reviewers have also noted that more can be done, especially by closely reviewing the pedagogical methods employed in course delivery. The reviewers noted that the department is in an excellent position to have a large impact on the broad civil engineering field, with evidence of well thought out strategic research directions. They were also critical of the department for not yet formulating how to change the curriculum to make these emerging areas of research accessible to their students.

The department's reply to the report outlines plans on new hires to address research areas where deficiencies were identified, review the availability of their technical staff for graduate needs, and strike several committees to extend funding for their MASc students and improve the curriculum of the MEng program.

The Dean's office will continue to work with the department appropriately to improve the program and assist in addressing the reviewers' concerns. The Faculty is working with the department to open several

new positions that certainly strengthen the transport and water areas, and add new courses to the graduate curriculum. Furthermore, the Dean's office will continue to assist the program in handling its challenges with graduate office space, having already provided significant funds for space reorganization, e.g., to follow a hoteling model. Space is overall limited however, and we will look to the department for innovative solutions to manage the needs of its graduate students. Finally, the ADL building was highlighted as a particular concern and the Faculty and University have already released funds for its renovation. The department is being encouraged to be proactive in identifying external funding opportunities to transform the interior of the ADL into a state-of-the-art facility.

Quality Assurance Committee Recommendation

McMaster's Quality Assurance Committee (QAC) recommends that the Civil Engineering Graduate program should follow the regular course of action with an 18-month progress report and a subsequent full external cyclical review to be conducted no later than 8 years after the start of the last review. At the time of the 18-month progress report, the department should comment on any pedagogical developments that have occurred since the cyclical review site visit.