FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review
School of Engineering Practice and Technology – Graduate Programs
Date of Review: May 20 - 21, 2021

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 the School of Engineering Practice and Technology. 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 Review

In accordance with the Institutional Quality Assurance Process (IQAP), the School of Engineering Practice and Technology graduate programs submitted a self-study in March 2021 to the Vice-Provost and Dean of Graduate Studies to initiate the cyclical program review of its graduate programs. The approved self-study presented program descriptions, learning outcomes, and analyses of data provided by the Office of Institutional Research and Analysis. Appendices to the self-study contained the CVs for each full-time member in the department.

Two arm's length external reviewers and one internal reviewer were endorsed by the Dean, Faculty of Engineering, and selected by the Vice-Provost and Dean of Graduate Studies. The review team reviewed the self-study documentation and then conducted a review on May 20 - 21, 2021. The review included interviews with the Provost and Vice-President (Academic); Faculty Dean, Vice-Provost and Dean of Graduate Studies, Associate Dean, Graduate Studies and Research, Associate Dean, Academic, Assistant Dean Director of the School of Engineering Practice and Technology and meetings with groups of current students, full-time faculty and support staff.

The Director of the School and the Dean of the Faculty of Engineering submitted responses to the Reviewers' Report (June 2021). Specific recommendations were discussed, and clarifications and corrections were presented. Follow-up actions and timelines were included.

External reviewers recognized:

The external reviewers are very impressed by the five MEng programs offered by the School of Engineering Practice and Technology at McMaster University, especially in light of a tough review five years ago. The MEng in Systems & Technology that was launched last year, and the MEng in Manufacturing Engineering, are both attracting strong interest from applicants; and the smaller programs in Engineering and Public Policy, Engineering Design, and Entrepreneurship and Innovation continue to attract a good number of quality students. The students we met from all programs were very positive; and the faculty, staff, and leadership teams impressed us by their dedication to the students, and to their programs. And while challenges remain: e.g. diversifying the applicant pool and student body; further developing relationships with local companies and organizations to source a more diverse set of student projects; building relationships with alumni; and returning to a "new normal" after COVID-19, these should also be viewed as opportunities, to further improve the quality and perhaps increase the enrolment of these five programs. Overall, these programs are of high quality, and appear well positioned to remain so, and to continue to attract a high number of quality students.

Program Strengths:

- strong interest, especially from international applicants
- currently a healthy enrolment in all five programs
- the new MEng S &T is exciting, and the MEng in Manufacturing appears to be thriving again after some down years
- active curriculum development/review processes, led by the Program Leads
- teaching and assessment methods are appropriate
- we heard very positive feedback from current students
- a strong leadership team, great group of core faculty, and a committed academic support team

Program Areas for Enhancement:

- engage with alumni, to gauge their success, and to tell their stories to current and future students
- recruit a more diverse group of international students
- improve outreach to incoming students, especially to clarify prerequisites
- build more engagement with sessional/adjunct faculty, as some would welcome being part of the teaching community
- continue to look for more industry/community partners, to source a more diverse set of projects

More specific areas for improvement described in the report are directly reflected in the recommendations, discussed below.

Implementation Plan

Please outline the recommendations made by reviewers and indicate how you plan to address the recommendations in the chart below.

Recommendation	**Proposed Follow-Up**	**Responsibility for Leading Follow-Up**	**Timeline for Addressing Recommendation**
Engage with alumni to gauge their success and to tell their stories to current and future students.	**Implement a system for tracking alumni progress and engage them in the recruiting process.** **SEPT will implement, in collaboration with Alumni Office of the Faculty of Engineering, as system for tracking careers of its alumni. There are constraints imposed on direct contacting due to privacy regulations.**	SEPT Associate Director of Graduate Studies, and Communications & Engagement Coordinator	August 2023
Recruit a more diverse group of international students	**SEPT Business Manager and Associate Director will work with the Dean's Office to develop a long-term marketing plan.** **Develop and implement a marketing plan for extensive outreach to Latin America and Africa.**	SEPT Business Manager, and Recruitment for Grad studies	August 2023
Improve outreach to incoming students, especially to clarify prerequisites.	**SEPT will review all documents describing admission requirements and make them consistent.** **Revise website content and enhance social media communications.**	Associate Director of Graduate Studies, and Team Lead of Academic Programs, Communications & Engagement Coordinator	February 2023
Build more engagement with sessional/adjunct faculty, as some would welcome being a part of the teaching community.	**Invite sessional faculty to participate in the evolution of the programs.** **SEPT will implement annual "improvement sessions/discussions" with all faculty (permanent and**	SEPT Director	May 2023

	sessional instructors) to identify areas for improvements.		
Continue to look for more industry/community partners to source a more diverse set of projects.	**Improve the framework for SEPT collaboration with community partners.** **Community engagement will leverage sessional instructors to generate more industry/society relevant projects with immediate application focus.**	SEPT Director, and Community Engagement Coordinators	Ongoing
Continue to work on integrating how the B.Tech and M.Eng. programs are delivered and taught and how to make best use of faculty and other resources.	**SEPT strategic plan (summer 2021) addresses this opportunity.**	SEPT Associate Directors	Ongoing
Develop recruitment/retention/development plans for faculty and keep an eye on fair workload distribution.	**SEPT's strategic plan (summer 2021) addresses this opportunity.**	Director, Associate Director of Graduate Studies, and Business Manager	Ongoing
Formalize how TAs are assigned, and perhaps make more use of TAs.	**SEPT will implement a transparent process for TA selection.**	Associate Director of Graduate Studies, and Business Manager	January 2023
Reflect on the past 18 months of COVID and on whether you might continue to offer some online courses, or components of courses, for the benefit of both students and the programs.	**SEPT will explore this avenue with the University Leadership team.**	Associate Director of Graduate Studies, and Team Lead of Academic Programs	Ongoing
Community Engagement: The feedback from students regarding community-sourced projects was overall positive. MEPP students would like to see more government-related project	**Associate Director of Graduate Studies and Community Engagement Coordinators will work with the program leads to address these items.**	Associate Director of Graduate Studies, Community Engagement Coordinators,	March 2023

opportunities. MED students spoke of too great a focus on healthcare projects.		Program Leads of MEPP and MED	
In the MEPP program, objective 1 is 'to provide a high-quality educational experience to graduate engineers and scientists". It is not clear if the students with "4-year non-STEM degree in a public policy-related field" could become "engineers and scientists" at graduation.	**Objectives of MEPP will be reviewed and aligned with the admission requirements.**	Director, and MEPP Program Lead	January 2023
All programs require online KIRA Talent interview. Some (4 out of 6) require additional live interview with director or faculty members, which will be conducted in future in a hybrid in-person and online mode. This is not very clear in the description.	**SEPT will review all documents describing the interview process and will revise them to clarify the steps.**	Director, and Team Lead of Academic Programs	February 2023
It is stated the part-time students are expected to complete in 28 months. What if more time is needed? Information for this is missing and would be helpful for part-time applicants.	**With transition to tuition per credit unit (in the Fall of 2021/222), extending part-time studies to longer than expected duration will not have adverse effects on student finances. Consequences of studying long than expected duration (i.e., longer than 28 months) will clearly be explained on the website.**	Director	Done (Worth noting that our part-time students now have 40 months to complete the program.)
MEPP program lacks one/more course(s) in Economics/Accounting and what is taught would be better situated later in the program rather than in the first term.	**Consult with students and faculty members and prepare a plan for addressing this.**	MEPP Program Lead	March 2023
Review the overlap of the MEME and MEng S&T programs vis-à-vis	**SEPT strategy is to let the market demand for different profiles of graduates decide**	Associate Director of Graduate	Reviewed annually

traditional manufacturing vs digital manufacturing	**the balance between the two. The issue of overlap will be reviewed annually**	Studies, Team Lead of Academic Programs, Program Leads of MEST and MEME	
Integration with B.Tech program remains a work in progress and deserves further attention.	**Director of SEPT is actively working on further integration with B.Tech**	Director	Ongoing
Students who live outside Hamilton (such as in Toronto) and have work or young family appreciated very much the on-line learning opportunity as the result of COVID-19. The School is encouraged to consider blending in-person and on-line programs post COVID-19 in future to increase the student pool for growth.	**SEPT will explore this avenue with the Dean of Engineering and the University Leadership team. Current McMaster plans for re-opening would not permit this.**	Program Leads, Associate Director of Graduate Studies, and Team Lead of Academic Programs	Ongoing
Teaching load may be quite heavy for course instructors due to project-based nature. TA might be needed to ensure the quality of delivery. There is no formal policy/procedure in the school to determine the TA needs of each course and the allocation.	**Associate Director of Graduate Studies and Business Manager will work with the Director and the Faculty members to derive a policy for TA allocation.**	Associate Director of Graduate Studies, Business Manager, and Director	January 2023
More information on course content and prerequisites provided up front. For instance, some courses require the skills of specific programming languages, such as Python and C.	**The requirements/prerequisites will be added to the course information online.**	Associate Director of Graduate Studies, Team Lead of Academic Programs	February 2023
Students in the MEEI/MTEI program indicated that the amount of work required for the 'toll gates' is significant and should be properly recognized.	**SEPT will consider introducing "enterprise project", multi-term course, which would reflect the amount of work required for the toll-gates preparation.**	Program Lead of MEEI/MTEI	April 2023

Provide more opportunities for interaction between students, in particular for international students.	**SEPT is acutely aware of this, particularly during COVID pandemic. In light of increased enrollment and MEST far exceeding initial enrollment projections, SEPT will ask the Dean's Office to return to SEPT the space on the 5th floor which was reallocated from SEPT to Engineering Physics several years ago (at that time SEPT enrollment was low).**	Director	Ongoing
Provide more opportunities for cross pollination of programs.	**SEPT has already planned annual "get togethers: for instructors in selected areas (e.g., data science instructors). We will implement mechanisms to include all instructors.**	Program Leads	Ongoing
External expert assessment is currently not a formal method assessment. For the program focused on applied study, the external expert assessment is critical for the success of students and program. Although it might be challenging to get quality and consistent assessment from external reports, the school is encouraged to consider this change by collaboration with external/industry mentors.	**While it may be difficult to implement this on a course-by-course basis, we think that the best way would be to include experts from collaborating partners in the evaluation of M.Eng. projects.**	Associate Director of Graduate Studies, and Community Engagement Coordinators	August 2023
The rapid expansion of SEPT has resulted in hiring many assistant professors (19 of 28) in the past few years. This might have an impact on manpower to deliver the program if too many take a sabbatical leave at the same time. No action plan was presented in the self-study.	**Director of SEPT will prepare a plan of sabbatical leaves and the corresponding substitute hirings.**	SEPT Director	May 2023

Dean's Response

The reviewers' comments highlight how significantly the school's programs have grown in scope of delivered content and in its innovative focus since the last IQAP review. Enrollment is higher in all programs; students are notably pleased with the content and still the school continues to find ways to explore new ideas for the benefit of its students. Their upcoming change from term-based fees to course-based fees, for example, will hopefully alleviate a significant pain point for students who can't complete a program in exactly one year. We have reviewed the reviewers' recommendations and the school's response and wish to add a few comments below.

The Faculty and department have given considerable attention to differentiating the Manufacturing and Systems & Technology programs over the past two years and will continue to ensure they remain clearly different in course selection for the future. Both programs are, however, topically associated with manufacturing and at the highest level, will always appear similar. We will work to make both programs clearly differentiated on our website and shared promotional materials. The latter recommendation on cross-pollination of content in the report is cautiously accepted, particularly with the above comments in mind, since we will not pursue a course of action that will overlap the programs too closely to one another.

Regarding sessional participation in curricular development, the Faculty welcomes their advice as well as the school's students on what will make a stronger, more relevant set of programs in SEPT. This is not however expected as a sole reason for employment since we have permanent faculty for such activities.

The suggestions on blended learning opportunities is consistent with the Faculty's guidance on transitioning from the pandemic where all activities were required to be carried out online. However, one of the value-added aspects of SEPT is that its programs include considerable active learning opportunities and personal contact with the students, and as such, we would not wish to see a virtual-only option for the current programs nor an excessive use of online teaching. We can and will consider additional new programs which are only virtual if there is a justifiable need in the market and a desire by the school.

Time requirements for all faculty in SEPT closely match those in SEAS. The Faculty gives credit for the mentoring required of the faculty in SEPT in its project requirements just like credit is given for mentoring sizable research groups in SEAS. TAs may be assigned if the load and cost is justified. Creating a policy is desirable since it will ensure transparency on matter.

We will assist the school on their other recommendations, as appropriate.

Quality Assurance Committee Recommendation:

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation, and the Committee recommends that the School of Engineering Practice and Technology – Graduate Programs should follow the regular course of action with an 18-month progress report and a subsequent full external cyclical review to be conducted 7 years after the start of the last review.