

## FINAL ASSESSMENT REPORT

### Institutional Quality Assurance Program (IQAP) Review

#### Engineering Physics Graduate Programs (M.A.Sc, M.Eng., Ph.D.)

**Date of Review: April 29<sup>th</sup> and 30<sup>th</sup>**

*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 Engineering Physics. 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 Engineering Physics program 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 all course outlines associated with the program and 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 remote review on April 29<sup>th</sup> and 30<sup>th</sup>, 2021. The review included interviews with the Provost and Vice-President (Academic); Vice-Provost and Dean of Graduate Studies, Associate Dean, Graduate Studies and Research, chair of the department and meetings with groups of current students, full-time faculty and support staff.

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

- **Strengths**
  - Quality of Research
  - Research Infrastructure
- **Areas for Improvement**
  - Graduate course availability
  - Inclusion
  - Student experience
  - Student recruitment
  - Graduate student financial support
  - MEng program

**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><b>Graduate course availability:</b> A list of “primary” courses would help build up a more structured ordering of courses that are consistently offered year-to-year so that graduate students know what courses are expected to be offered throughout their program. A cross-linking of courses with an ENG PHYS designation to courses in other departments may also help make the selection of courses in EngPhys more appealing to students. Clear messaging and active encouragement for graduate students to take cross-listed and out of department courses will help alleviate student concerns about limited department course offerings.</p>	<p>The department will review our graduate course offerings in the following 4 directions: a) increasing the course requirements which will increase the demand for courses, making it possible to make more available, b) adding new courses to meet needs where possible, c) cross-listing courses from other departments and d) planning primary course offerings to be offered on a regular schedule. The improved course offerings will be communicated to our students through various media.</p>	<p>Department/Department Chair</p>	<p>Update at 18-month follow-up report</p>
<p><b>Inclusion:</b> It is recommended that recruitment processes for both graduate students</p>	<p>As part of the development of a graduate student recruitment strategy, the</p>	<p>Department/Department Chair</p>	<p>Update at 18-month follow-up report</p>

<p>and new faculty be implemented for inclusion and attraction of female and diverse candidates.</p>	<p>department will prioritize the diversification of our graduate student cohort.</p>		
<p><b>Student experience:</b>  Better communication should be sought with on-line instruction and research supervisors. Equipment training and maintenance should be recognized to make sure new students are able to effectively start their experimental research. Some graduate students (especially, the female students) suggested they would further benefit from a department seminar course where alumni and/or other prominent external speakers (including female speakers) were brought in for talks regularly. A teaching assistant training module may help students carry out their teaching duties with more confidence and skill.</p>	<p>The department will encourage faculty to stay in closer contact with students during the pandemic and also take extra steps to ensure research facilities are available to students, so that delays are not incurred. We will review the structure of the Seminar Course and also revitalize the Department Seminar Series, which lapsed during the pandemic. There is a three-hour training program offered to TAs by the Department at the beginning of each term which will be reviewed and revised, especially in light of virtual teaching, to help the TAs become more engaged participants in the undergraduate student experience.</p>	<p>Department/Department Chair</p>	<p>Update at 18-month follow-up report</p>
<p><b>Student recruitment:</b> It is recommended that recruitment processes for undergrad students from EngPhys (or equivalent) programs at other universities in Canada be developed.</p>	<p>In the 2013 IQAP review <i>"it was noted that the department does not seem to have a coherent graduate student recruitment strategy"</i>. This remains the case, in part due to the decentralized nature of the recruitment process. The department will explore ways in which we can work more effectively as a group to meet common recruitment needs, while preserving faculty autonomy.</p>	<p>Department/Department Chair</p>	<p>Update at 18-month follow-up report</p>

<p><b>Graduate student financial support:</b> It is recommended that more active messaging be employed regarding graduate student financial support to dispel any student concerns (about pay variances).</p>	<p>The department will communicate more clearly the newly established graduate pay levels, for visa/domestic MAsc/PhD students. They have already introduced a new process whereby students that transfer from the Master's to PhD program receive a written statement of their funding for the duration of the program.</p>	<p>Department/Department Chair</p>	<p>Update at 18-month follow-up report</p>
<p><b>MEng program:</b> It is recommended to evaluate the program enrollment and student satisfaction after collecting a few years of data.</p>	<p>The MEng program in its present form is quite new and will take several years to develop in the way we anticipate. By the next IQAP review the department will have sufficient data to establish whether the program is successful and if it should be continued, revised, or closed.</p>	<p>Department/Department Chair</p>	<p>Update at 18-month follow-up report</p>

### Faculty Response

The Faculty is very pleased with the reviewers' comments in the recent IQAP review of graduate programs in the Department of Engineering Physics. The review highlights a department that is well positioned on the international stage in several key areas of research related to energy and electronics and makes note of the outstanding infrastructure in the department to aid their graduate students in the very influential contributions. Students appear to be happy with the programs, faculty and resources which the department provides for timely degree completion.

A series of recommendations were offered in the report to improve the graduate programs of the department, to which the Dean's office will provide support. They note and applaud the reviewers' comments related to equity and inclusion. The department's intent to develop an improved recruitment strategy should benefit from the redesigned applications system being prepared by SGS. Efforts at the department, Faculty and university level will continue to shape our graduate community to better reflect the public we serve. The Faculty will also continue to help the department in tuning the curricula and learning outcomes of their MEng program (as well as all programs) as well as ultimately assessing its viability as more data is collected.

Some of the reviewers' recommendations are a bit short sighted though since dwelling on pandemic times for research progress does not seem helpful unless there are concerns connected to similar behaviours occurring during times of normal operation. They want to also highlight what seems to have been missed by the reviewers that the Faculty already invests heavily in TA training with 5 hours of paid experiential training that they offer (but not been required to do) to help prepare students for their teaching assignments. More training ahead of starting one's assignment does not seem warranted though more meetings with course instructors may help alleviate the stress of expectations on these TAs.

The Faculty's goals and initiatives are closely aligned to the department and they will continue to assist in its success.

### **Quality Assurance Committee Recommendation**

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation and the committee recommends that the program should follow the regular course of action with a progress report and subsequent full external cyclical review to be conducted no later than 8 years after the start of the last review.