

FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review

Materials Science and Engineering (Graduate Programs)

Date of Review: February 18th and 19th, 2025

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 offered by the department of Materials Science and 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 Review

In accordance with the Institutional Quality Assurance Process (IQAP), the Materials Science and Engineering department submitted a self-study in January 2025 to the Vice-Provost and Dean of Graduate Studies to initiate the cyclical program review of its program. 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 virtual review to McMaster University on February 18th and 19th, 2025. The review included interviews with the Deputy Provost, Faculty, Dean, Vice-Provost and Dean of Graduate Studies, Associate Dean, Grad Studies and Research, Chair of the program and meetings with groups of current students, full-time faculty and support staff.

The Chair of the program and the Dean of the Faculty of Engineering submitted responses to the Reviewers' Report (June 2025). Specific recommendations were discussed and clarifications and corrections were presented. Follow-up actions and timelines were included.

Strengths

The program stands out for its strong research focus, interdisciplinary collaborations with leading institutes including the Brockhouse Institute for Materials Research (BIMR), the Biointerfaces Institute, McMaster Automotive Resource Centre (MARC), CANMET, and the Canadian Center for Electron Microscopy (CCEM), and access to advanced research facilities. Opportunities like the Co-op option enhance practical learning, and steady enrollment along with planned faculty hires position the program for continued growth and success.

Opportunities for Improvement and Enhancement

- **Promotion of Diversity:** Efforts to promote diversity within the program, ensuring an inclusive environment are encouraged.
- **Departmental Promotion of Program Opportunities for Student Recruitment:** A systematic department-wide recruitment approach would help to attract more students.
- **Provide More Information to Newly Admitted Students:** There is an opportunity to provide more information to newly admitted students before arrival at McMaster.
- **Expand the Number and Diversity of Graduate Courses:** The availability and diversity of graduate courses seem to be a concern raised by several students.
- **Reassess the Future Format of the Graduate Seminar:** Review and consider adjustments to the graduate seminar format to ensure it remains a valuable platform for student engagement, networking, and academic development.
- **Increase Awareness of Available Resources for Current Students:** Improve networking, communication and visibility of the various resources available to current students, ensuring they are aware of the support systems and opportunities.
- **Address Stipend Support Issues:** Students expressed frustration about the challenges associated with the cost of living and the available financial support.
- **Strengthen Connections with the Nuclear Engineering Program:** Explore opportunities for closer collaboration with McMaster's strong nuclear engineering program and enhancing interdisciplinary research.

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

Recommendation #1: Promotion of Diversity

Department's Response and Actions to be Taken:

The department recently started holding MSE Diversity event for Faculty of Engineering. We had two events shortly after the IQAP review. The topics are 1. Unconscious Bias in Engineering and Science (March 20th) and 2. Picture a Scientist (March 27th). We will continue doing so in future years.

Dean's Response:

MSE has clear plans for amplifying the importance of diversity in the department. I'd also note they are unique in holding these events at a departmental level and have been running them for over a year.

Recommendation #2: Departmental Promotion of Program Opportunities for Student Recruitment

Department's Response and Actions to be Taken:

Our graduate admin speaks at level 4 Engineering classes about the graduate program. She also speaks at graduate open houses at McMaster (September Open House and May Open House).

We've started planning to invite final year undergraduate students with a 10 GPA or higher to our graduate seminar.

Dean's Response:

The departmental efforts are further enforced by an investment in communications for prospective students being undertaken this year by the Faculty – with departmental engagement confirmed by the program. The Faculty represents MSE at the Canadian Engineering Graduate Consortium fairs across the country and will continue to support them in their efforts described above.

Recommendation #3: Provide More Information to Newly Admitted Students

Department's Response and Actions to be Taken:

Our graduate admin support new students with the following:

Provide graduate handbook to students

Send emails to incoming students: enrolling in courses, time at McMaster, McMaster resources, and what to expect with arrival at McMaster

Have 1 on 1 meetings with new incoming students about housing/living costs, transportation to and from the airport, life at McMaster/Canada, and other inquiries they may have

Dean's Response:

The department has a dedicated graduate administrator for ~70 students. Departmental handbooks are revised annually and do include information on arrival, etc. Students also have access to university resources for immigration advising and international students.

Recommendation #4: Expand the Number and Diversity of Graduate Courses

Department's Response and Actions to be Taken:

The department chair and associate graduate chair have met with their counterparts at the university of Toronto and discussed encouraging students to take graduate courses through *Ontario Visiting Graduate*

Student (OVGS) Plan. The existing UofT-Mac-Waterloo agreement for course sharing is expected to facilitate this action. Commuting poses a challenge; one approach to address this could be identifying one graduate course that can be delivered in a hybrid format. We continue with cross-listing courses with the other departments.

Dean's Response:

Exploring collaborations with other universities is a novel approach for smaller programs such as MSE, keeping in mind the limitations on OVGS that can be taken in a degree.

Recommendation #5: Reassess the Future Format of the Graduate Seminar

Department's Response and Actions to be Taken:

The graduate seminar has been revamped after the previous IQAP review to go beyond student presentations. The graduate seminar now includes targeted sessions on key research communication skills. These seminars are on Data Analysis and Visualization, Reference Management in Presentations, Getting to the Big Picture: How to Frame Your Presentation, and Slide Design & Visualization. The seminar also includes a final survey that facilitates continuous growth.

The department has recently submitted a Student Curriculum Consultant Application form to MacPherson Institute in order to hire a graduate student to draft and perform a survey about the graduate seminar. The future of the graduate seminar will be reassessed based on the results of this survey.

Dean's Response:

The faculty supports this initiative to consider the continuous development of the seminar course.

Recommendation #6: Increase Awareness of Available Resources for Current Students

Department's Response and Actions to be Taken:

This concern was somewhat unexpected, as the graduate handbook is quite comprehensive and the administrative team regularly shares information about available resources via email. Nonetheless, to further increase awareness, we plan to make announcements in MATLS 701, 702, and 724, which are courses taken by most graduate students.

Dean's Response:

This is a reasonable approach to improving communication on the resources already well detailed in the handbook.

Recommendation #7: Address Stipend Support Issues

Department's Response and Actions to be Taken:

We understand the concerns about financial support and the cost of living. While this is a broader issue involving faculty and external funding agencies, we keep communication open across all parties. Materials Science and Engineering department offers one of the highest stipend levels in the faculty, and many supervisors also provide top-ups or side projects so students don't need to work off-campus.

Dean's Response:

The Faculty is supportive of departments considering stipend support adjustments, noting MSE is above the university and Faculty minimums.

Recommendation #8: Strengthen Connections with the Nuclear Engineering Program

Department's Response and Actions to be Taken:

Prof. Suraj Persaud has recently been offered a position in the area of materials for nuclear reactors within the Materials Science and Engineering Department and plans to join in 2026. His addition will significantly enhance the department's involvement and visibility in nuclear research.

Dean's Response:

This new hire will strengthen the program links to nuclear research.

Implementation Plan

Recommendation	Action(s) to be Taken	Responsibility for Leading Action (specify the role(s) that will be responsible for each action item e.g. Program Chair.)	Timeline for Completing Action (indicate specific timelines (e.g. not 'ongoing') for action)
Promotion of Diversity	Continue holding MSE diversity events	Graduate Admin	Currently in effect
Departmental Promotion of Program Opportunities for Student Recruitment	Invite final year undergraduate students with a 10 GPA or higher to our graduate seminar	Graduate Admin	Sept 2026

Provide More Information to Newly Admitted Students	Provide graduate handbook to students Send emails to incoming students: enrolling in courses, time at McMaster, McMaster resources, and what to expect with arrival at McMaster Have 1 on 1 meetings with new incoming students about housing/living costs, transportation to and from the airport, life at McMaster/Canada, and other inquiries they may have	Graduate Admin	Currently in effect
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Expand the Number and Diversity of Graduate Courses	Encouraging students to take courses from U of T Course Cross listing Exploring the possibility of delivering one U of T graduate course in a hybrid format	Associate Graduate Chair, Department Chair	Sept 2027
Reassess the Future Format of the Graduate Seminar	Design and perform a survey about the graduate seminar format	Associate Graduate Chair	May 2026
Increase Awareness of Available Resources for Current Students	Make announcements in MATLS 701, 702, and 724, which are courses taken by most graduate students.	Associate Graduate Chair	Sept 2025
Address Stipend Support Issues	Open communication across all parties	Associate Graduate Chair, Department Chair	NA
Strengthen Connections with the Nuclear Engineering Program	New hire: Prof. Suraj Persaud	NA	Currently in effect

Quality Assurance Committee Recommendation

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation at the October 22, 2025, meeting. The committee recommends that the **Materials Science and Engineering graduate** program should follow the regular course of action with an 18-month progress report and subsequent full external cyclical review to be conducted no later than eight years after the start of the last review.