



University of Toronto Quality Assurance Process (UTQAP) Cyclical Review: Final Assessment Report and Implementation Plan

Program(s):	Materials Engineering, B.A.Sc. Materials Science and Engineering, M.A.Sc. Materials Science and Engineering, M.Eng. Materials Science and Engineering, Ph.D.
Division/Unit:	Department of Materials Science and Engineering
Commissioning Officer:	Cristina Amon, Dean, Faculty of Applied Science and Engineering
Reviewers (Name, Affiliation):	<ol style="list-style-type: none">1. Dr. Lorna J. Gibson, Matoula S. Salapatras Professor of Materials Science and Engineering, MIT2. Dr. Hani Henein, Professor, Department of Chemical and Materials Engineering, University of Alberta3. Dr. Gary R. Purdy, Professor, Department of Materials Science and Engineering, and former Dean of Engineering, McMaster University4. Dr. Stephen Yue, James McGill Professor and Chair, Department of Mining and Materials Engineering, McGill University
Date of review visit:	May 13 - 14, 2013
Date reported to AP&P:	October 29, 2013

1 Outcome

The Committee on Academic Policy and Programs (AP&P) concluded that the Decanal response adequately addressed the review recommendations.

2 Significant Program Strengths

- Many well-structured, interactive and innovative learning opportunities available to undergraduate students
- Strong, highly productive research programs

- Positive morale in the faculty complement

3 Opportunities for Program Improvement and Enhancement

The reviewers recommended that the following be considered:

- Reforming undergraduate curriculum to both streamline offerings and better position courses within the programs
- Creating a core set of graduate courses and regularizing the offering of specialized graduate courses
- Better allocating space to encourage research programs of newer faculty
- Updating undergraduate laboratory spaces
- Creating a mentoring program for new faculty
- Offering equity and diversity training to search committees
- Making strategic junior faculty hires and increasing the complement of computational materials professors

4 Implementation Plan

The Dean undertook in consultation with the Department to support the following changes:

- Immediate Term (within the next year)
 - Reforming undergraduate curriculum
 - The Department's curriculum committee will map Materials Science and Engineering (MSE) courses and propose content realignment to faculty for feedback.
 - In Fall 2014, the Department will eliminate a quarter course that largely overlaps with a more advanced course on the same subject and change another quarter course to a half-year course, to strengthen the program's mathematics content, including statistics, and to meet accreditation and external expectations.
 - Through its Materials One initiative, the Department will identify common course content to be modularized over the next three years.
 - Developing and regularizing the graduate curriculum
 - The Faculty's graduate curriculum committee will consider core graduate courses, and determine the instances where MSE graduates could be exempt.
 - The Faculty's graduate curriculum committee will consider offering specific Master of Engineering courses.
 - Better allocating space
 - The Department's Space Committee will examine the current space audit and will consider a space policy similar to those in force in other Faculty of Applied Science and Engineering (FASE) departments.
 - The Department Chair, using the Space Committee's recommendations, will begin reallocating space.

- Updating undergraduate laboratory spaces
 - In Fall 2013, the Department opened the Walter Curlook Materials Characterization and Processing Laboratories, adding to the inventory of lab space for undergraduate students.
- Creating a mentoring program for new faculty
 - The Department will formalize a mentoring program for assistant professors through pairing new faculty with experienced faculty; providing them with examples of past portfolios from candidates who have successfully undergone third-year review or tenure review; and continuing regular meetings with the Department Chair.
 - The Department will arrange for its representative Faculty's promotions committee to meet with associate professors and clarify the criteria used for promotion to full professor.
- Offering equity and diversity training to search committees
 - The Department's extractive metallurgy search committee will actively recruit candidates, with a focus on females.
- Increasing the complement of computational materials professors
 - The Department will continue to support the efforts of the recent hire in computational materials to introduce more computation and facility with different software packages as an integral part of the undergraduate program.
- Medium Term (2-3 years)
 - Reforming undergraduate curriculum
 - The Department's curriculum committee will finalize its plans, with the first changes coming forward in Fall 2014 and major changes starting in Fall 2015.
 - Overall curricular reform goals include streamlining the number of required courses and reducing the number of technical electives offered; modularizing first-year courses; focusing the second and third year on fundamental knowledge; and reinforcing core concepts throughout the program.
 - Developing and regularizing the graduate curriculum
 - The Department will roll out a revised graduate course structure in stages.
 - Updating undergraduate laboratory spaces
 - The Faculty will open the Centre for Engineering Innovation and Entrepreneurship (CEIE) in the Fall 2016, significantly expanding the Faculty's inventory of classroom space, including TEAL and tutorial rooms, which can be used for labs.
- Longer Term (4-5 years)
 - Reform undergraduate curriculum
 - The Department will assess the outcome of the curricular reform.
 - Better allocating space
 - The Department will develop a space policy that will provide a guide and rationale for future space allocations.
 - Updating undergraduate laboratory spaces
 - The Department will prioritize fundraising for undergraduate laboratories.
 - Creating a mentoring program for new faculty
 - The Department will revitalize the Research Committee so that new faculty can be guided in the development of cross-Faculty initiatives and funding opportunities.

- Offering equity and diversity training to search committees
 - The Department will explore opportunities for diversity training for future search committees.
 - The Department will aim to have faculty gender balance that meets or exceeds that of the MSE student population, which is 25-30% female.
- Making strategic junior faculty hires and increasing the complement of computational materials professors
 - The Department will hire at least two new faculty in process metallurgy, one of whom may be computational.

The Dean's Office will follow up annually with the unit to assess progress.

5 Executive Summary

The reviewers identified as strengths the Department's many well-structured, interactive and innovative learning opportunities for undergraduate students; its strong, highly productive research programs; and the positive morale in the faculty complement. The reviewers recommended that the followings issues be addressed: reforming undergraduate curriculum; creating a core set of graduate courses and regularizing the offering of specialized graduate courses; better allocating space to encourage research programs of newer faculty; updating undergraduate laboratory spaces; creating a mentoring program for new faculty; offering equity and diversity training for search committees; making strategic junior faculty hires; and increasing the complement of computational materials professors. The Department's curriculum committee will engage in a comprehensive undergraduate curriculum review and reform process over the next three years and will roll out a revised graduate course structure in stages over the next two to four years. The Department will use its current space audit to develop a space policy to support future allocations. Undergraduate students have access to new labs in the Walter Curlook Characterization and Processing Laboratories, and the Department will continue to fundraise for new labs. The mentoring program for new faculty will be formalized. The Department will work to add more women and computational materials faculty to its complement. The Committee on Academic Policy and Programs concluded that the Decanal response adequately addressed the review recommendations.