



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

Program(s):	Mechanical Engineering, B.A.Sc. Industrial Engineering, B.A.Sc. Mechanical and Industrial Engineering, M.A.Sc., M.Eng., Ph.D. Joint M.Eng. in Design and Manufacturing, M.Eng.D.M.
Division/Unit:	Department of Mechanical and Industrial Engineering
Commissioning Officer:	Dean, Faculty of Applied Science & Engineering
Reviewers (Name, Affiliation):	<ol style="list-style-type: none">1. Dr. Nadine Aubry, Dean, College of Engineering, Northeastern University2. Dr. Mark Daskin, Clyde W. Johnson Professor and Chair, Department of Industrial and Operations Engineering, College of Engineering, University of Michigan3. Dr. Jerzy Maciej Floryan, Professor and Chair, Department of Mechanical and Materials Engineering, Faculty of Engineering, University of Western Ontario4. Dr. Glenn Heppler, Professor and former Chair, Department of Systems Design Engineering, Faculty of Engineering, University of Waterloo5. Dr. Kon-Well Wang, Stephen P. Timoshenko Collegiate Professor of Mechanical Engineering, Tim Manganello/BorgWarner Department Chair, Mechanical Engineering, Department of Mechanical Engineering, College of Engineering, University of Michigan
Date of review visit:	November 4 - 5, 2013
Date reported to AP&P:	April 1, 2014

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

- Industrial Engineering (IE) and Mechanical Engineering (ME) programs rank among the top 15-20 worldwide
- Excellent quality of departmental leadership
- High national and international standing of faculty; strong faculty and student publication and citation record
- Excellent climate and morale among faculty, students, and staff

3 Opportunities for Program Improvement and Enhancement

The reviewers recommended that the following be considered:

- Expanding hands-on learning opportunities in addition to the undergraduate IE capstone design course
- Enhancing student advising for third- and fourth- year IE students and Master of Engineering (M.Eng.) students
- Exploring variability in M.Eng. student quality
- Distinguishing between graduate courses designed for M.Eng. students and those for research students
- Examining time-to-completion for Ph.D. students
- Expanding further the Industry and Alumni Advisory Boards and increasing the number of women on both
- Determining an appropriate balance between core methodologies and applied research in the Department
- Attending to the current need for student space

4 Implementation Plan

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

- Immediate Term (6 months)
 - Expanding hands-on learning opportunities for undergraduate IE students
 - The Department will continue to offer upper-year “learning-by doing” IE courses.
 - Enhancing student advising
 - The Department will increase the number of academic information sessions offered to students entering third and fourth year, allowing for the eight disciplinary areas to be addressed in greater depth.
 - The Department will introduce electronic and print Course and Option Selection Handbooks for students in 2014-15.
 - Exploring variability in M.Eng. student quality

- The Department will establish an annual graduate exit survey, interview process, and town hall meeting to gather feedback from M.Eng. students.
- The Department will form a task force to recommend enhancements to the M.Eng. program and its associated student services and consult broadly on the task force's report.
- Distinguishing between graduate courses for M.Eng. students and those for research students
 - The Department has introduced several applied courses on topics of interest to M.Eng. students, taught by experienced engineers.
 - The Department has introduced more evening courses to accommodate working M.Eng. students.
- Examining doctoral time-to-completion
 - The Department will implement a system to remind students regularly of their time to completion goals.
- Expanding further the Industry and Alumni Advisory Boards
 - The Department will cultivate relationships with potential board members and encourage members to identify candidates.
- Determining an appropriate balance between core methodologies and applied research
 - The Department will continue to maintain a faculty complement that is strong in both core methodologies and applied areas.
- Attending to the current need for student space
 - The Department will increase access to space for M.Eng. students, including the three undergraduate computer labs and design shop.
 - The Department will apply for funding to relocate and renovate the student design studio.
 - The Department will address demand for printing by adding eight computers dedicated to printing in one of the computer labs.
- Medium Term (1-2 years)
 - Expanding hands-on learning opportunities for undergraduate IE students
 - The departmental Curriculum Committee will review existing upper-year courses.
 - The Department will focus on maturing fourth-year capstone courses.
 - The Department will hire a faculty member in order to keep up with the high demand and increasing enrollment of the IE program.
 - Exploring variability in M.Eng. student quality
 - The Department will begin implementing the task force's recommendations, an advising program, and an internship program for M.Eng. students.
 - The Department will implement "3+2" and "3+1+1" programs wherein international students may attend the University for the fourth year of their Bachelor of Applied Science degree and remain to complete the M.Eng. degree.
 - Distinguishing between graduate courses for M.Eng. students and those for research students
 - The Department will continue to offer courses of interest to M.Eng. students and will add to the five existing M.Eng. program emphases.

- Examining doctoral time-to-completion
 - The Department will identify non-qualified doctoral candidates during the qualifying examination stage.
 - The Department will continue to discuss this issue with faculty to raise awareness and identify solutions.
 - The Department will continue to promote the fast-track M.A.Sc. to Ph.D. program.
- Expanding further the Industry and Alumni Advisory Boards
 - The Department will recruit additional members for each board and consider recruiting more junior females.
- Attending to the current need for student space
 - The Department will continue to promote shared research lab space and will use other available space in the Faculty for student group activities.
- Longer Term (3-5 years)
 - Expanding hands-on learning opportunities for undergraduate IE students
 - The Department will strive to increase the IE faculty complement through fundraising for endowed chairs and Natural Sciences and Engineering Research Council of Canada (NSERC) Industrial Research Chairs.
 - The departmental Curriculum Committee will work with new faculty to create courses with hands-on learning components.
 - Exploring variability in M.Eng. student quality
 - The Department will work to build a robust M.Eng. program.
 - The Department will consider establishing an integrated B.A.Sc./M.Eng. program.
 - Examining doctoral time-to-completion
 - The Department will continue to address any issues that negatively influence time-to-completion.
 - Expanding further the Industry and Alumni Advisory Boards
 - The Department will expand the membership of both boards to 10-15 members, with an increased number of women.

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

5 Executive Summary

The reviewers identified the programs' strengths as ranking among the top 15-20 programs worldwide; the excellent quality of departmental leadership and morale among faculty, students, and staff; the national and international standing of faculty; and an impressive faculty and student publication and citation record. The reviewers recommended that the following issues be addressed: expanding hands-on learning opportunities for undergraduate IE students; enhancing student advising for IE and M.Eng. students; exploring variability in M.Eng. student quality; determining target audiences for graduate courses; examining doctoral time to completion; further expanding the Industry and Alumni Advisory Boards and increasing the number of women on both; and attending to the current need for student space. In addressing the recommendation to expand hands-on learning opportunities, the Department will enhance fourth-year capstone courses. The Department also plans to strengthen support for students. The Department intends to introduce articulated programs, providing flexibility while meeting

the needs of international students. The Department will continue to offer M.Eng. evening courses and will add program emphases. The Department will continue to work with faculty to address issues affecting time-to-completion. It will also continue to engage members of the community, including women, on the Industry and Alumni Advisory Board. As well, the Department will continue to promote shared research lab space and identify other means of addressing space issues. The Committee on Academic Policy and Programs concluded that the Decanal response adequately addressed the review recommendations.