

# UTQAP Cyclical Review: Final Assessment Report and Implementation Plan

## 1 Review Summary

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| <b>Program(s) Reviewed:</b>                         | Mechanical Engineering, BAsC<br>Industrial Engineering, BAsC<br>Mechanical & Industrial Engineering, MEng, MASc, PhD   |
| <b>Unit Reviewed:</b>                               | Department of Mechanical and Industrial Engineering  |
| <b>Commissioning Officer:</b>                       | Dean, Faculty of Applied Science and Engineering   |
| <b>Reviewers (Name, Affiliation):</b>               | <ul style="list-style-type: none"><li>• Professor Brian Denton, Professor and Chair, Industrial and Operations Engineering, University of Michigan</li><li>• Professor Garud Iyengar, Professor, Industrial Engineering and Operations Research, Columbia University</li><li>• Professor Sheldon Green, Professor, Mechanical Engineering, University of British Columbia</li><li>• Professor Jayathi Murthy, Dean, Henry Samueli School of Engineering and Applied Science, University of California, Los Angeles</li></ul> |
| <b>Date of Review Visit:</b>                        | June 27-28, 2022   |
| <b>Review Report Received by VPAP:</b>              | October 6, 2022  |
| <b>Administrative Response(s) Received by VPAP:</b> | October 6, 2023  |
| <b>Date Reported to AP&amp;P:</b>                   | October 24, 2023   |

## **Previous UTQAP Review**

**Date: November 4-5, 2013**

### **Summary of Findings and Recommendations**

#### **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

#### **Opportunities for Program Enhancement**

- 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

## **Current Review: Documentation and Consultation**

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### **Documentation Provided to Reviewers**

Terms of reference; self-study; summary of last UTQAP review report (2013) and administrative response; summary of last accreditation (2018) by the Canadian Engineering Accreditation Board (CEAB); access to all course descriptions; access to the curricula vitae of faculty; FASE Academic Plan (2017-2022) and Annual Impact Report (2021); and University of Toronto Quality Assurance Process.

## Consultation Process

Faculty, undergraduate and graduate students, administrative staff and senior program administrators as well as the Dean's academic leadership team and members of relevant cognate units.

## Current Review: Findings and Recommendations

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### 1. Undergraduate Program(s)

*Unless otherwise noted, all bulleted comments apply to all programs reviewed.*

The reviewers observed the following **strengths**:

- Overall quality
  - ▶ Programs were recently accredited for maximum six-year term by the Canadian Engineers Accreditation Board (CEAB)
- Admissions requirements
  - ▶ Undergraduate programs attract superior students
  - ▶ Average entering high school grades into undergraduate programs has risen steadily in recent years
- Curriculum and program delivery
  - ▶ Considerable flexibility offered in undergraduate programs relative to Canadian peers, due to breadth of faculty expertise; many technical electives available
  - ▶ Flexibility allows most students to take at least one minor or certificate
  - ▶ Industrial Engineering faculty have recently revamped the undergraduate curriculum
- Student engagement, experience and program support services
  - ▶ An impressive 70% of students do a Professional Experience Year
  - ▶ Student feedback was overall positive, and metrics around student experience are at or above international norms

The reviewers identified the following **areas of concern**:

- Overall quality
  - ▶ Despite its accreditation success, the Department has expressed concern about the onerousness of the process
- Curriculum and program delivery
  - ▶ Mechanical Engineering curriculum has not been refreshed in over a decade
  - ▶ MIE has the highest student to faculty ratio of all major FASE departments
- Accessibility and diversity
  - ▶ Department does not identify and track underrepresented students apart from those who identify as women
- Student engagement, experience and program support services
  - ▶ Number of support staff who provide undergraduate advising appears smaller than needed, and is below the norm for comparable departments

- ▶ Students expressed concerns about departmental and faculty supports for the PEY program and the opportunities and employers available
- ▶ Some students note concerns with quality of certain sessional lecturers
- Quality indicators – alumni
  - ▶ Department does not track student career outcomes

The reviewers made the following **recommendations**:

- Curriculum and program delivery
  - ▶ Consider enhanced offerings in Artificial Intelligence in the Industrial Engineering curriculum
  - ▶ Mechanical Engineering curriculum is overdue for review and updates; consider whether its flexibility relative to peer institutions is a strength or weakness
  - ▶ Examine Mechanical Engineering solid mechanics course requirements relative to Canadian peers; consider core course offerings in areas of vibrations and controls
  - ▶ Reviewers strongly recommend that the Department consider hiring additional faculty, to reduce the student-to-faculty ratio and maintain quality of academic programs
- Accessibility and diversity
  - ▶ Monitor the enrolment and progress of Indigenous, Black, disabled, first-generation and other groups that are underrepresented in engineering; this data might be used to enhance available supports for these groups
- Student engagement, experience and program support services
  - ▶ Reviewers recommend considering hiring additional advising staff
  - ▶ Follow up with students about their experiences in the PEY program to evaluate its success and vet future potential employers
  - ▶ Consider hiring additional teaching stream faculty to reduce reliance on sessional lecturers, and institute annual review process for sessionals
- Quality indicators – alumni
  - ▶ Department should implement systems to track undergraduate student progress and career outcomes

## 2. Graduate Program(s)

*Unless otherwise noted, all bulleted comments apply to all programs reviewed.*

The reviewers observed the following **strengths**:

- Overall quality
  - ▶ Many positive trends in MIE graduate programs in last 5-10 years
  - ▶ Graduate programs appear well managed, with capable leadership
- Admissions requirements
  - ▶ Increasing demand for the MEng program; particularly among international students, and in the areas of analytics, machine learning and artificial intelligence
  - ▶ Proportion of admitted MEng students has gone from 70% to 30%, implying greater selectivity due to increased demand

- Curriculum and program delivery
  - ▶ Significant rise in MEng enrolment has increased the number of non-research masters course offerings; the department has appropriately reacted to this need by hiring additional teaching stream faculty
  - ▶ Department has substantially increased offerings related to data analytics and machine learning, which has benefited Master's and PhD students
- Student engagement, experience and program support services
  - ▶ Adoption and implementation of a new graduate management system to track student progress appears to have positively impacted PhD students
  - ▶ Graduate students interviewed were generally positive about their experiences in the programs
- Quality indicators – graduate students
  - ▶ Significant reduction in PhD completion time since 2013 review, from a mean of 5.7 years to 4.6
  - ▶ PhD time-to-completion significantly shorter than the average for science and engineering across U of T
- Quality indicators – alumni
  - ▶ Department not actively tracking performance measures such as job placement, starting salary, and overall satisfaction, making it difficult to assess outcomes
- Student funding
  - ▶ Increased available teaching assistantship support for faculty has provided additional opportunities for graduate student financial support

The reviewers identified the following **areas of concern**:

- Admissions requirements
  - ▶ “Overall the yield on offers for master's programs is between 50% and 60%, leaving some room for improvement”
  - ▶ Managing MEng admissions and other administrative activities is increasingly challenging due to size of program
  - ▶ Some faculty observed an insufficient number of high-quality domestic graduate students
- Curriculum and program delivery
  - ▶ Coverage of artificial intelligence and machine learning topics is expanding quickly due to demand, with negative impacts on the Mechanical Engineering component of the MEng program
  - ▶ MIE instructors note concerns about class sizes
  - ▶ Students expressed concerns about being unable to enrol in classes outside of MIE that are oversubscribed
- Accessibility and diversity
  - ▶ Percentage of women graduate students has not grown since the last review
  - ▶ Current recruiting for MSc and PhD is done by individual faculty results in a lack of general oversight of the diversity of the student body

- Student engagement, experience and program support services
  - ▶ Unclear whether there is sufficient support for graduate students who have difficulties with their advisers or fellow students; lack of clarity around pathways for reporting harassment, bullying, or other concerns
  - ▶ Many graduate students indicate they do not know who to go to for help with navigating the Department as a new student, and are unaware of centralized University resources
  - ▶ Graduate administrative staff appear to be busy to accommodate student needs

The reviewers made the following **recommendations**:

- Admissions requirements
  - ▶ Consider whether central graduate recruiting efforts for MSc and PhD programs could broaden the pool of applicants and improve yields
  - ▶ Recruiting efforts that offer students greater flexibility to identify an advisor during their first year could help attract students unsure of what research areas interest them, and could target students graduating in adjacent STEM areas
- Curriculum and program delivery
  - ▶ Consider opportunities to expand the Mechanical Engineering MEng program, to diversify offerings
- Accessibility and diversity
  - ▶ Track diversity in the graduate programs to assess the participation of underrepresented groups
- Student engagement, experience and program support services
  - ▶ Students may benefit from the opportunity to learn about various research areas before finalizing their dissertation advisor

### 3. Faculty/Research

The reviewers observed the following **strengths**:

- Research
  - ▶ Departmental research output is excellent
  - ▶ MIE department covers a broad range of research areas comprising both traditional and new, developing fields
  - ▶ MIE faculty received a number of prestigious awards recognizing their excellence in research between 2013 and 2021
  - ▶ Since the last review, MIE faculty have helped create and lead several Faculty and Institution-level research Centres
  - ▶ MIE faculty have good success with obtaining research funding
  - ▶ Faculty publication numbers have remained constant over the review period, and citation counts have increased
  - ▶ Faculty metrics are aligned with North American peers and departmental rankings are rising

- ▶ “In summary, the research profile of the Department is strong and on an upward trend”
- Faculty
  - ▶ Department has made many strong faculty hires since its last review
  - ▶ Junior faculty speak highly of their experiences, feel well-supported, and appear to be well-informed about tenure and career progression standards
  - ▶ Establishment of the teaching stream in 2015 appears to have been a very positive development for formalizing the role and value of these faculty
  - ▶ Teaching-stream faculty appear happy and optimistic about career prospects
  - ▶ Teaching mentorship appears excellent; the Department assigns a mentor to each junior faculty member, and mentors are evaluated as a part of the program

The reviewers identified the following **areas of concern**:

- Faculty
  - ▶ “As is typical of many departments, the Department is heavier on full professors, and associate and assistant professors are fewer in number”
  - ▶ Standards for career progress for teaching stream faculty still appear somewhat uncertain
  - ▶ Mentorship for teaching stream faculty appears weaker than that for the tenure stream
  - ▶ Department is approximately 24% female, and recent hires have tended to be predominantly male

The reviewers made the following **recommendations**:

- Research
  - ▶ Given department’s growing strength in Analytics, opportunity noted to diversify research funding sources to include industry and foundations
- Faculty
  - ▶ Develop more transparent communication about career advancement and enhance mentorship, particularly for teaching-stream faculty
  - ▶ Develop supports and mechanisms to address the concerns of underrepresented and female faculty; communicate clearly about grievance and redress mechanisms

## 4. Administration

*Note: Issues that are addressed through specific University processes and therefore considered out of scope for UTQAP reviews (e.g., individual Human Resources issues, specific health and safety concerns) are routed to proper University offices to be addressed, and are therefore not included in the Review Summary component of the Final Assessment Report and Implementation Plan.*

The reviewers observed the following **strengths**:

- Relationships
  - ▶ Department appears collegial and supportive, and there appears to be significant trust in and respect for leadership
  - ▶ Department has competent and well-functioning staff with clearly defined roles and good morale, many of whom are long-standing employees
- Organizational and financial structure
  - ▶ “Overall, the Department seems well-organized and ably led, and the long tenures of the current and immediate-past department chairs have provided enviable stability and consistency”
  - ▶ Chair is assisted by three Associate Chairs – Graduate, Undergraduate, and Research
  - ▶ A number of MIE committees are in place to address graduate and undergraduate curricula, faculty promotion and tenure, scholarships and other issues
  - ▶ Department is in an “enviable” financial position
  - ▶ FASE enables a great deal of entrepreneurial energy in the Department, which has fully capitalized to attract MEng students; resulting funding stream has helped fund graduate student stipends, reduce burden on faculty to provide research assistantships through grants, and has allowed department to make investments in refurbishing and developing its facilities
- Long-range planning and overall assessment
  - ▶ Department is performing at a high level under current leadership
  - ▶ Academic programs generally are thriving and in high demand, under capable leadership and with significant engagement of MIE faculty
  - ▶ “Overall, the Department is in excellent shape, and successful growth over time now affords new opportunities and goal setting to take advantage of the substantial portfolio of faculty research, academic programs, and the prosperous financial position of the Department”
- International comparators
  - ▶ Unit is “is comfortably in the top 40 departments worldwide”

The reviewers identified the following **areas of concern**:

- Organizational and financial structure
  - ▶ At the time of the site visit the Chair was embarking on administrative leave at the end of his first term, and an interim chair had not yet been named
  - ▶ Reviewers note some concerns regarding the MIE business model, including a disproportionate dependence on a single revenue stream based on the current interest in Artificial Intelligence and Machine Learning; this could pose a risk if interest in AI/ML diminishes
  - ▶ Reviewers note that there is no departmental space committee in place (while there typically are such committees in most similar Canadian and US departments)
  - ▶ Research space repeatedly raised as a serious concern; faculty have grown from 40 to 66 since 2000 with no increase in research space, and undergraduate lab space has been “cannibalized” by research



- Long-range planning and overall assessment
  - ▶ Reviewers note very limited emphasis on diversity in the review process, and limited discussion about formal programs to diversify the faculty and student ranks
  - ▶ “We heard little about support structures for under-represented and women faculty and students”
  - ▶ Reviewers note a lack of clarity around what strategic framework (beyond financial motivation) is driving the significant expansion of the MEng
  - ▶ MEng program supported almost entirely from faculty in industrial engineering; “growth in industrial engineering and shifts in the relative size of academic programs may strain the Department in the future”

The reviewers made the following **recommendations**:

- Relationships
  - ▶ Think strategically about growing the impact of research centres, develop partnerships with government and industry, and align topics to urgent societal needs (such as additive manufacturing, health and human safety, sustainability, and robotics)
  - ▶ Enhancing PEY relationships with industry could have ancillary benefits in enhancing departmental research
  - ▶ Invest in outreach and alumni development to develop alternative research funding sources
  - ▶ Develop an industry advisory board or similar body to provide a means to actively benefit from advice of department’s rich alumni base
- Organizational and financial structure
  - ▶ Consider renting space on or near campus as a short-term measure to address research space needs
  - ▶ There is a clear need for enhanced and additional undergraduate lab space, particularly mechatronics and wet labs; some labs appear outdated and may require modernization
- Long-range planning and overall assessment
  - ▶ Department strongly encouraged to develop a long-term strategic plan in collaboration with the Faculty and University that addresses key challenges on the horizon, including strategic complement planning; space and facilities planning; oversight of the MEng program; formation of an industry advisory board or similar body; tracking key performance measures and evaluating progress towards long-term goals; and conducting a holistic review of curricula, in particular for Mechanical Engineering
  - ▶ Develop a long-term complement plan for growth in areas of research excellence and focusing on departmental and University strengths
  - ▶ Create long-term facilities plan to address future needs of the department, including potential need for a new building
  - ▶ Strategic plan should include appropriate high-level goals and a description of performance measures

- ▶ Carefully and strategically consider the potential academic, organizational and cultural impacts of a larger MEng contingent; ensure that high standards are maintained in the program, there is adequate staffing, and students are integrated into the cultural life of the Department
- ▶ Consider how growth of MEng and related increase in teaching stream faculty impact departmental research, and identify potential synergies, such as using funding from MEng to support research activities, or involving teaching stream faculty and MEng students in applied translational research
- ▶ Develop formal strategic programs to diversify faculty complement, with 5- and 10-year goals, metrics, and annual self-assessments of performance; track career progression and salary metrics to ensure equitable advancement
- ▶ Develop focused programs to diversify the student body
- ▶ Track key performance measures related to academic programs, research and faculty, staff, and student diversity to evaluate progress towards long-term goals

## 2 Administrative Response & Implementation Plan



UNIVERSITY OF TORONTO  
FACULTY OF APPLIED SCIENCE & ENGINEERING

October 2, 2023

Professor Susan McCahan  
Vice-Provost, Academic Programs  
University of Toronto  
27 King's College Circle

Dear Professor McCahan,

I write in response to your letter of June 6, 2023 regarding the June 2022 external review of the Department of Mechanical & Industrial Engineering (MIE) and its undergraduate and graduate programs.

On behalf of the Faculty of Applied Science & Engineering, I would first like to thank the reviewers, Professors Brian Denton, University of Michigan; Sheldon Green, University of British Columbia; Garud Iyengar, Columbia University; and Jayathi Murthy, University of California, Los Angeles, for their very comprehensive review of the department. I would also like to thank the interim chair, chair, faculty, administrative staff, and all those who contributed to the preparation of the self-study. I also wish to thank the many staff, students, and faculty members who met with the external reviewers and provided thoughtful feedback.

The external review process is a valuable exercise that affords us the opportunity to take stock of the state of our academic units and of the Faculty as a whole. We are extremely pleased with the reviewers' favourable comments on the department's academic programs, research output, superior students and engaged and capable faculty.

The quality of the unit and its programs notwithstanding, the review report raises a number of issues and challenges. These have been addressed in the attached table, which was developed in consultation with the chair of the Department of Mechanical & Industrial Engineering. For each area addressed, an implementation plan is provided that identifies actions to be accomplished in the short (six months), medium (one to two years) and longer (three to five years) terms, and who (department, Dean) will take the lead in each area.

Comments on the draft *Final Assessment Report and Implementation Plan* have been provided by my office.

I anticipate the next review of the Department of Mechanical & Industrial Engineering will be in 2027-2028 to coincide with end of the chair's term. Chairs and directors in FASE are

expected to report on progress made toward their external review goals at least annually at a meeting of the chairs and directors, which I chair.

I acknowledge that you will request a brief report midway between the 2021-2022 review and the year of the next site visit.

I am unfortunately unable to attend the October 24, 2023 meeting of the Committee on Academic Policy & Programs but the department chair, Markus Bussmann, will attend to answer any questions that may arise regarding this review.

Thank you very much for the opportunity to respond to the report of the external review team. Their comments and recommendations will help inform the vision and future priorities for the Department of Mechanical & Industrial Engineering.

Sincerely,



Chris Yip  
Dean

cc:

Prof. Markus Bussmann, Chair, Department of Mechanical & Industrial Engineering  
Caroline Ziegler, Faculty Governance and Programs Officer, Faculty of Applied Science & Engineering  
Daniella Mallinick, Director, Academic Programs, Planning and Quality Assurance  
David Lock, Coordinator, Academic Planning and Reviews  
Emma del Junco, Acting Coordinator, Academic Planning and Reviews

Attachment

## 2021-22 UTQAP Review of the FASE Department of Mechanical and Industrial Engineering - Review Recommendations

Please do the following for each recommendation in the table:

- If you **intend** to act on a recommendation, please provide an **Implementation Plan** identifying actions to be taken, the time frame (short, medium, long term) for each, and who will take the lead in each area. If appropriate, please identify any necessary changes in organization, policy or governance; and any resources, financial and otherwise, that will be provided, and who will provide them.
- If you **do not** intend to act on a recommendation, please briefly explain why the actions recommended have not been prioritized.
- In accordance with the UTQAP and Ontario's Quality Assurance Framework, "it is important to note that, while the external reviewers' report may include **commentary** on issues such as faculty complement and/or space requirements when related to the quality of the program under review, **recommendations** on these or any other elements that are within the purview of the university's internal budgetary decision-making processes must be tied directly to issues of program quality or sustainability" (emphasis added)
- You may wish to refer to the [sample table](#) provided by the Office of the Vice-Provost, Academic Programs

| Request Prompt<br><i>verbatim from the request</i>  | Rec. # | Recommendations from Review Report<br><i>verbatim from the review report</i>   | Program Response   | Dean's Response   |
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| <p>The reviewers made a number of observations and potential suggestions related to enhancing the undergraduate program, including:</p> <ul style="list-style-type: none"> <li>• Reviewing and updating the Mechanical Engineering curriculum; consider enhancing Artificial Intelligence offerings</li> <li>• Monitoring the enrolment and progress of underrepresented groups in the undergraduate programs</li> <li>• Addressing undergraduate laboratory space needs</li> <li>• Exploring approaches to enhance undergraduate advising and supports</li> <li>• Tracking undergraduate student progress and career outcomes</li> </ul> | 1      | <p>"Curriculum modifications: The Industrial Engineering undergraduate curriculum has been revamped recently, and the reworked curriculum is going through the approval process. In our conversations with the various stakeholders, several curriculum reform suggestions are worthy of careful examination. The interest in AI has become so widespread that the Department should consider introducing a course on AI. The Mechanical Engineering program has not seen significant changes in ten years and is ready for review."</p> | <p><i>Immediate (6 months) and medium term actions (1-2 years)</i></p> <p>An ad hoc ME curriculum renewal committee was struck (Fall 2022); part of its mandate is to consider how best to evolve curriculum on math and numerical methods to include an introduction to AI/ML. Projected presentation to Faculty Council by Fall 2025.</p> <p>But even now, ME undergraduate students can pursue a Minor and a Certificate in AI Engineering, via elective and extra courses.</p> | <p>Regarding the review of the ME curriculum, the Dean's Office has advised the Department that resources are available from the Office of the Vice-Provost, Innovations in Undergraduate Education, such as Program Innovation Funds (PIF) and support from the Curriculum Development Specialist.</p> <p>Over the past five years, 81 MIE students have completed a certificate (21% of all completions), and 91 MIE students have completed a minor (19% of all completions). During this time, 1,489 MIE students were enrolled in courses related to the AI minor, including 207 MIE students enrolled in the minor itself.</p> <p>The Faculty will continue to enhance the selection of its minors and certificates. Topics currently under development include electric vehicles and human factors and psychology engineering.</p> |
|   | -      | <p>"Undergraduate Lab space: The MIE Department has grown aggressively in its faculty count without a</p>  | See below  | See below.  |

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|   |   | commensurate increase in space, leading to an overall space shortage in the Department. For undergraduate education, this manifests itself in the following ways:   |  |  |
| 2 | <ul style="list-style-type: none"> <li>There is a clear need for superior and additional space for U/G labs, particularly for mechatronics and wet labs.</li> </ul>   | <p><i>Medium and longer term actions (1-5 years)</i><br/>Signed a lease for 1000+ NASMs of new research and office space near the St. George campus. Occupancy expected June 2024. This will free up space in the Rosebrugh Building, part of which is currently targeted for a new undergraduate mechatronics/manufacturing lab to be built in the next three years, subject to funding.</p> | The Dean's Office recognizes that the Department has already started to address proactively the review report recommendation regarding additional space requirements and will work with the Department to help ensure that resources are brought to bear on these opportunities.   |  |
| 3 | <ul style="list-style-type: none"> <li>Some of the laboratories (e.g., the vibrations labs) seemed outdated. The Department might wish to review its current laboratories and modernize where appropriate."</li> </ul>  | <p><i>Longer term action (3-5 years)</i><br/>We acknowledge that a number of our ME undergraduate labs are outdated. In addition to a new mechatronics/manufacturing lab (see response to #2) that will include new equipment, we are developing plans for new EV-related labs in MC120, and we are due to replace some outdated equipment in MC215/216 within the next few years.</p>        | The Dean's Office is excited to see that the Department is developing plans for new experiential labs, especially in the strategic areas of EV technologies and that initiatives are underway to update and upgrade lab resources. This is well aligned with Faculty advancement priorities around renewal and upgrading of undergraduate experiential learning opportunities. |  |
| - | "Undergraduate advising and support: Here, we collect our recommendations about various aspects of student support.   |   |  |  |
| 4 | <ul style="list-style-type: none"> <li>The number of support staff who provide advising to undergraduates appears to be smaller than the need and is below the norm for comparable departments. We recommend that additional advising staff be hired.</li> </ul>                                      | <p><i>Completed</i><br/>Created and filled 3rd- &amp; 4th-year advising position (Fall 2022). Created and filled a new Manager of Academic Programs position (Fall 2023), whose portfolio includes first-line management of academic advisors.</p>  | The Dean's Office is pleased that MIE has hired additional academic advisors, and a related management-level position. These new positions will be certainly well received by the undergraduate MIE community. These portfolios will liaise with their counterparts in other units in Engineering to share best practices around academic advising.                            |  |
| 5 | <ul style="list-style-type: none"> <li>Students expressed concerns about departmental/faculty support for the Professional Experience Year (PEY) program and the opportunities/employers available on the portal. We recommend that the Department follow up with students about their PEY</li> </ul> | <p><i>Immediate action (6 months)</i><br/>The PEY Co-op program is run centrally by the Engineering Career Centre (ECC). MIE will consult with the ECC on how to track IE and ME undergraduate student experience with</p>  | The Engineering Career Centre regularly reviews and builds upon the success of the PEY program. For instance, in September 2020, the ECC launched a new co-op model that provides engineering students access to workplace preparatory programming during  |  |

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|  |   | <p>experiences to evaluate the success of the program and vet future potential employers on the basis of the quality of the student experience. Enhancing PEY relationships with the industry could have ancillary benefits in enhancing departmental research</p>                        | <p>PEY, and look to partner with the ECC to improve our students' experience.</p>   | <p>Year 1 and 2. This significantly enhanced program has been well received by the undergraduate students.</p> <p>Of the 1017 students currently in PEY, 261 (25.7%) are from MIE.</p> <p>ECC is committed to delivering a minimum 2:1 ratio regarding co-op positions per student. For MIE, there is a 3.5:1 ratio resulting from job growth of over 50% and 950 positions being available to 274 MIE students (specifically) in our 2023/24 recruitment cycle. From the pool of 274 students, 261 of them were successful in securing a 12-16 month work term which is a yield of 95%.</p> <p>The Dean's Office encourages MIE to discuss the tracking and support of PEY students with other FASE departments, and to work with the FASE Partnerships team to help develop potential research collaborations through these PEY linkages.</p> |
|  | 6 | <ul style="list-style-type: none"> <li>MIE has the highest student-to-faculty ratio of all major FASE departments. We strongly recommend that the Department hire additional faculty to reduce the student-to-faculty ratio and maintain the quality of the academic programs.</li> </ul> | <p><i>Ongoing action</i></p> <p>MIE has had the highest undergraduate and graduate student-to-faculty ratios in the FASE for a number of years, due especially to strong student interest in our programs. Since 2020 we've hired 14 new faculty (by headcount) while a number have left the University for various reasons; nevertheless, the ratios are still high, and so MIE will continue to petition for new positions as long as we have the office and lab space to accommodate them.</p> | <p>The Faculty will work proactively with the Department to encourage recruitment of new faculty especially in growth areas such as AI, machine learning and mechatronics. The Faculty also recognizes that space constraints and the need to renovate and modernize undergraduate teaching labs is a key challenge in recruiting new faculty to the Department (See recommendation #3).</p>  |
|  | 7 | <ul style="list-style-type: none"> <li>Several students commented on substandard sessional lecturers. The Department might wish to consider hiring additional teaching stream</li> </ul>  | <p><i>Immediate (6 months) and medium term actions (1-2 years)</i></p>  | <p>The Dean's Office commends the Department's recent hiring of additional Teaching Stream faculty and encourages it to</p>   |

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|  |   | <p>faculty to reduce its reliance on sessionals. If the Department does not currently do it, we recommend that the Department institute an annual review of sessionals.”</p>   | <p>MIE has hired six Teaching Stream faculty since 2020, including one in January 2023 and one in July 2023; and may petition for yet additional positions to reduce our reliance on sessionals. Sessional instructor performance is reviewed by the Chair and the Associate Chair of Undergraduate Programs after each academic term.</p>   | <p>continue to address the review report recommendation regarding its high student-to-faculty ratio.</p> <p>We encourage MIE to proactively seek student input on sessional lecturer performance and to share best practices with other FASE units.</p> <p>We also encourage the Department to make use of the institutional teaching and training resources available for faculty, including CTSI and FASE EdTech units.</p>  |
|  | 8 | <p>“Tracking student progress: The Department currently does not track its student career outcomes (e.g., % who find a job in the first six months, average starting salary). We recommend that the Department institute systems to track undergraduate student progress and career outcomes.”</p> | <p><i>Completed</i><br/>Created and filled a new Manager of Academic Programs position (September 2023), whose portfolio includes program outcomes assessment.</p>   | <p>The Dean’s Office commends the Department’s creation and staffing of the Manager of Academic Programs office and looks forward to following the development of the portfolio.</p> <p>We encourage the Department to work proactively with the Faculty ECC / PEY and Alumni Relations offices to ensure more fulsome tracking of both recent and past graduates.</p>   |
| <p>The reviewers also made a number of observations and potential suggestions related to enhancing the graduate programs, including:</p> <ul style="list-style-type: none"> <li>• Exploring central recruiting efforts for the MSc and PhD programs</li> <li>• The reviewers observed a lack of clarity regarding the strategic framework behind the significant expansion of the MEng program in recent years. They urged the Department to strategically and comprehensively consider the needs of a larger MEng contingent, as well as the potential impacts on departmental operations, staffing, culture, and research</li> </ul> | 9 | <p>“Graduate Student Recruiting: Consider whether some central graduate recruiting efforts for MASc and PhD programs could improve yields.”</p>  | <p>For most of 10 years the FASE Vice-Dean, Graduate Studies has led two Faculty-wide recruiting initiatives: a partnership with other leading Canadian engineering programs to promote graduate studies and recruit graduate students; and an event during reading week in February that allows units to invite top applicants to the U of T to meet different professors. I don’t foresee that we would further centralize our recruiting efforts.</p> | <p>The Dean’s Office agrees that the Faculty provides robust central graduate recruiting efforts: the Canadian Graduate Engineering Consortium (CGEC) raises awareness among undergraduate and master’s students about pursuing graduate studies and recruits graduate students, and Graduate Research Days (GRD) allows FASE to showcase its professors, research and facilities to invited top applicants.</p> <p>Additionally, over the past several years the Faculty’s Engineering Career Centre (ECC) has added a number of new roles to expand its capabilities and services to students. Looking ahead, the ECC will work closely with the</p> |



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| <ul style="list-style-type: none"> <li>Monitoring the enrolment and progress of underrepresented groups in the graduate programs</li> <li>Exploring approaches to enhance supports for graduate students</li> <li>Tracking graduate student performance measures and outcomes</li> </ul> |    |  |  | <p>office of the Vice Dean, Graduate Studies to build the capacity for a full-time recruitment function catering to graduating students and alumni, fostering deeper connections with industry partners.</p> <p>Of particular note, we are exploring opportunities to improve the recruitment of MEng students in a more proactive and centralized fashion to the Faculty. This will include better promotion of the broad suite of MEng opportunities across departments.</p> |
|  | 10 | <p>“Balancing research and teaching: The MIE Department has seen a significant rise in the number of students in the (course-based) MEng program, increasing the number of non-research masters course offerings. The Department has appropriately reacted to this need by hiring more Teaching Stream faculty who are now approximately 10% of the faculty strength. We recommend that the Department consider how this impacts research and look for potential synergies. For example, perhaps funding from the MEng program could support additional research activities within the Department; or maybe there is an opportunity to involve the teaching faculty and MEng students in applied translational research. Currently, the MEng students are heavily focused on Analytics. By thinking about them as part of the research enterprise, there might be ways to expand or diversify the program into Energy, EV, and Robotics. “</p> | <p>Funding from the MEng program is a large contributor to the Department budget, and a significant portion of these funds are already directed to support our research stream (MAsc, PhD) graduate students.</p> <p><i>Medium term action (1-2 years)</i><br/>The Department appointed a faculty Director of Professional Programs in July 2022; the focus in 2023/24 will be on expanding MEng student engagement with research projects. This may become an official Associate Chair position by July 2024.</p> | <p>The Dean’s Office recognizes that the Department will be addressing the review report recommendation regarding ways to strategically integrate MEng students into the broad scope of applied research. This will open up more opportunities for research partnership and funding in strategic areas of interest to MIE and FASE, especially with corporate partnership.</p>   |
|  | 11 | <p>“Growth of MEng Program: MEng program enrollment has grown to a total of about 450 students. This is a very positive sign of success for these programs; however, there are some challenges to consider as well:</p> <ol style="list-style-type: none"> <li>Managing MEng admissions and other administrative activities are increasingly challenging.</li> <li>AI/ML is growing fast because of solid demand and starting to squeeze the ME component of the</li> </ol>  | <p><i>Immediate action (6 months)</i><br/>(a) The staff complement in the Graduate Studies Office was recently expanded from four to five, to address the admin workload associated with our MEng students.</p> <p><i>Medium term action (1-2 years)</i><br/>(b) MEng emphases already exist in Sustainable Energy and in Robotics; an MIE</p>   | <p>The Dean’s Office recognizes that there are a number of strategic opportunities associated with MEng and other related learning opportunities, including microcredential and bespoke targeted certificate programs, especially in the analytics and AI spaces.</p> <p>MIE, through the CARTE initiative, has been piloting a number of innovative models to</p>   |

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|  |    | <p>MEng program. The committee recommends considering if there are opportunities to expand the ME MEng program to diversify offerings.</p> <p>c. Resource constraints: Some MIE instructors are worried about the size of classes. Some students expressed concerns about not being able to enroll in some classes outside of MIE that are oversubscribed.”</p> | <p>ad hoc committee on EV curriculum was struck in January 2022 to develop undergraduate and graduate programming related to EVs, including a new MEng emphasis. We need to better market such offerings. Also in July 2023, MIE appointed a new Chalmers Chair in Engineering Design with a program emphasizing MEng design curriculum and resources.</p> <p><i>Ongoing action</i><br/> (c) Over the past few years we have developed a number of popular courses targeted (but not exclusively so) at MEng students; in several cases we offer more than one section of those each academic year. We will continue to create courses, and add sections, as much as possible to meet student demand. As for courses outside of MIE, we have little control over our students’ access to those.</p> | <p>engage corporate partners in bespoke programming.</p>  |
|  | 12 | <p>“Graduate Student Diversity: Track diversity in the programs to assess the participation of underrepresented groups (broadly defined) in engineering. “</p>  | <p><i>Ongoing action</i><br/> Established an MIE EDI Committee (July 2022). Identified FASE data sources for under-represented groups. This is an initiative that we will continue to work on.</p>  | <p>The Faculty was one of the original members of the IBET network which provides fellowships and internships opportunities for Black and Indigenous PhD students. This program is managed through the Vice-Dean, Graduate Studies portfolio and involves all the graduate units in the Faculty.</p> <p>The Department’s efforts will be incorporated into a broader effort at the Faculty level to recognize under-represented groups in graduate level programs in Engineering.</p> |
|  | 13 | <p>“Graduate Student Support: Support for graduate students is limited, and it is unclear to many students the review team talked to who to contact for help when they encounter problems”</p>  | <p><i>Immediate action (6 months)</i><br/> Will review website language related to funding, and ensure that we clearly indicate who to go to for information/help.</p>  | <p>The Dean’s Office broadly recognizes the need for stronger, more cohesive communications with graduate students in general and efforts are underway to develop stronger partnerships with student organizations such as GECOS.</p>   |

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|   | 14 | “Graduate Program Outcomes: The Department is not actively tracking performance measures such as job placement, starting salary, and overall student satisfaction levels, which makes it difficult to assess overall outcomes from the various master’s and PhD programs”                | <i>Medium term action (1-2 years)</i><br>Created and filled a new Manager of Academic Programs (September 2023), whose portfolio includes program outcomes assessment. Working with the Associate Chair of Graduate Studies, and the Director of Professional Programs, will assess what’s possible in terms of ongoing tracking of graduate student outcomes.                            | The Dean’s Office recognizes that the Department will be addressing the review report recommendation regarding graduate program outcomes. This is a common challenge across all departments. The Department is encouraged to work also with the Faculty’s Advancement Office in this regard.                      |
| The reviewers recommended developing more transparent communications about faculty advancement and enhancing faculty mentorship, particularly for members of the teaching-stream.   | 15 | “Mentorship: Develop more transparent communication about career advancement and better mentorship, particularly for teaching-stream faculty.”   | <i>Medium term action (1-2 years)</i><br>Having hired six Teaching Stream faculty since 2020, this is and will be a priority for the Chair in the coming years. As this is a concern for chairs and directors throughout FASE, MIE leadership will liaise with other units on developing best practices in this regard.   | With support of the Dean’s Strategic Fund, several workshops and networking opportunities have been held over the past three years for early career faculty, both teaching and tenure-track. These are designed to help build community and share best practices and experiences across all early-career faculty. |
| The reviewers highlighted a significant apparent lack of Departmental engagement with matters related to Equity, Diversity and Inclusion. They urged the Department to develop a formal strategy to grow and support both a diverse faculty complement and student body, and to develop and clearly communicate support structures and mechanisms to address concerns of underrepresented and female faculty. | 16 | “Diversity: Develop formal programs to diversify faculty, with 5- and 10-year goals, metrics, and annual self-assessments of performance. Track career progression and salary metrics to ensure equitable advancement. Develop focused programs to diversify the graduate student body.” | <i>Completed</i><br>The Department has launched a funding incentive to attract more Black and Indigenous MASc and PhD students.<br><br><i>Medium term action (1-2 years)</i><br>FASE is currently developing its next strategic plan; MIE will follow, beginning with a faculty retreat in June 2024. Faculty hiring, and how to diversity the faculty complement, will be on the agenda. | The Faculty’s Office of Diversity, Inclusion and Professionalism, which collects data, provides training and builds equity programs to increase access, will be a resource for MIE regarding diversity.<br><br>It is expected that the Faculty’s next academic plan will be completed in 2024-2025.               |
|   | 17 | “Support for Underrepresented Groups: Develop support structures and mechanisms to address the concerns of underrepresented and female faculty. Communicate clearly about grievance and redress mechanisms.”   | <i>Medium term action (1-2 years)</i><br>The Chair will seek advice on this recommendation from the recently established MIE EDI Committee (July 2022), and more broadly from underrepresented and female faculty; and then act on that feedback.   | The Faculty’s Office of Diversity, Inclusion and Professionalism; its Engineering Equity, Diversity and Inclusion Action Group; the Dean’s Advisor on Black Inclusivity; the Dean’s Advisor on Indigenous Inclusivity; and the Dean’s Advisor on LGBTQ can act as resources in this regard.                       |
|   | 18 | “Student Diversity: Currently, the Department does not identify and track underrepresented students, apart from individuals who self-identify as female. We recommend monitoring the enrollment and  | <i>Medium term action (1-2 years)</i><br>Established an MIE EDI Committee (July 2022). Identified FASE data sources for   | As above, support and advice can be provided by the Faculty’s EDI resources.  |

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|  |    | progress of Indigenous, Black, disabled, first-generation, and other (broadly defined) underrepresented groups in engineering. This data could potentially be used to improve the support available to these groups.”   | under-represented groups. This is an initiative that we will continue to work on.  |  |
| The reviewers highlighted opportunities for the Department to enhance connections with industry, government and foundations, and to strategically grow the impact of its affiliated research centres.      | 19 | “Research funding: The MIE Department has a good funding record from government sources. However, given the Department's growing strength in Analytics, there is an opportunity to diversify to industry and foundation funding; perhaps, in collaboration with IBME in the healthcare area or ECE in machine intelligence and robotics. We recommend that the Department devote resources to developing this alternative funding source by investing in outreach and alumni development activities. “  | <i>Medium term action (1-2 years)</i><br>Created and filled a Research and Business Development Officer position (August 2023) who will explore this further.  | The Dean’s Office has increased resourcing of the Vice-Dean, Research portfolio to now include grant writers, communications personnel and a finance officer. The Faculty’s Partnerships office has now grown to two business development officers and an Executive Director who are focused on creating and stewarding partnerships across both industry and government.<br><br>We continue to support the equivalent of 1.5 FTE business development offices from MITACS (co-funding model). This successful partnership has been crucial in securing significant support from the MITACS programs for graduate internships. |
|  | 20 | “Research partnerships: The MIE Department is well diversified in research areas from carbon capture and fluidics to AI/ML and healthcare optimization, and it has recently developed research centers devoted to many of these topics. We recommend that the Department think strategically about growing the impact of these centers by finding government and industry partners and aligning the topics to urgent societal needs, such as additive manufacturing, health and human safety, sustainability, and robotics, to name some examples.” | <i>Medium term action (1-2 years)</i><br>Created and filled a Research and Business Development Officer position (August 2023).<br><br>Also, FASE is currently developing its next strategic plan; MIE will follow, beginning with a faculty retreat in June 2024. On the agenda is defining our core research strengths, and how to support them. | The Faculty’s Executive Director, Partnerships (a role created in January 2023) can act as a resource for MIE in this regard.<br><br>It is expected that the Faculty’s next academic plan will be completed in 2024-2025.  |
| The reviewers strongly recommended that the Department develop a long-term strategic plan to address key challenges on the horizon. They emphasized in doing so, the Department should consider: long-term | 21 | “We strongly encourage the Department to develop a long-term strategic plan in collaboration with the Faculty and University that addresses some of the key challenges on the horizon, including:   | <i>Medium term action (1-2 years)</i><br>FASE is currently developing its next strategic plan; MIE will follow, beginning with a faculty retreat in June 2024.   | The Dean’s Office recognizes that the Department will be addressing the review report recommendation long-term strategic planning.   |

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| <p>complement planning; facilities planning to address space needs (including exploring creative strategies to address immediate needs); oversight of the MEng program; connections with industry; research; growing and supporting diverse faculty, student, and staff bodies; and conducting a holistic review of curricula.</p> |    |   |   | It is expected that the Faculty's next academic plan will be completed in 2024-2025.   |
|  | 22 | <ul style="list-style-type: none"> <li>Long-term hiring plan for growth in areas of research excellence and plans for strategic growth that focus on the strengths of the Department and the University.</li> </ul> | <p><i>Medium term action (1-2 years)</i><br/>Per #21, this will be on the agenda.</p>   | As above.  |
|  | 23 | <ul style="list-style-type: none"> <li>Facilities plan to address a space deficit that is a burden for academic programs and faculty research.</li> </ul>   | <p><i>Medium term action (1-2 years)</i><br/>As a first step towards addressing space needs, signed a lease for 1000+ NASMs of new research and office space near the St. George campus. Occupancy expected June, 2024.</p> <p><i>Immediate action (6 months)</i><br/>And as recommended, MIE will establish a space committee to consider how to make better use of the space we have, and develop a plan for new space that we need going forward.</p>                              | <p>The Dean's Office will continue to work proactively with MIE and all departments to identify and act on strategic opportunities to address the space needs of MIE specifically and the Faculty as a whole. As an example, securing the 800 Bay Street location to support the temporary relocation of select MIE faculty will provide the department with swap space to help renovate on-campus space for experiential labs, and an opportunity to rethink and reimagine other existing spaces.</p> <p>We will work with all chairs and directors on innovative solutions for the Faculty's space needs through the development of the Faculty's Master Plan.</p> |
|  | 24 | <ul style="list-style-type: none"> <li>Oversight of the MEng program, which has grown significantly since the last review.</li> </ul>   | <p><i>Immediate action (6 months)</i><br/>Created and filled a new Manager of Academic Programs position (September 2023) whose portfolio includes program outcomes assessment. Also plan to create a new Graduate Office staff position specifically for MEng student advising.</p> <p><i>Medium term action (1-2 years)</i><br/>Appointed a faculty Director of Professional Programs in July 2022; this is likely to become an official Associate Chair position by July 2024.</p> | As described earlier, the Faculty is developing better marketing and engagement of the MEng students across the Faculty. This will include considering the creation of an internship stream that will be available for all MEng students. There are already a number of MEng programs in Engineering that include a mandatory internship. Such programs are well-received by students and in a way would involve emulating the undergraduate programming provided by the Faculty's ECC / PEY Office.   |
|  | 25 | <ul style="list-style-type: none"> <li>Formation of an industry advisory board or a similar body to provide an active means for the</li> </ul>  | <p><i>Medium term action (1-2 years)</i></p>  | The Dean's Office and Office of Advancement will review plans to ensure that the Faculty   |

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|    |   | Department to benefit from the advice of its rich alumni base.  | For many years MIE had an Advisory Board, that (for complicated reasons) was dissolved in 2020. Will work with FASE Advancement in the coming year to develop plans to constitute a new one.  | and departmental needs are met as part of the Defy Gravity campaign objectives.   |
| 26 | • | Track key performance measures related to academic programs, research, faculty, staff, and student diversity to evaluate progress towards long-term goals.  | <i>Medium (1-2 years) and longer term (3-5 years) actions</i><br>This is addressed by responses #5, 8, 12, 14, 16, 18. In the coming years, we will endeavour to track progress on multiple fronts.   | The Dean's Office recognizes that the Department will be addressing the review report recommendation regarding the tracking of key performance measures.  |
| 27 | • | Conduct a holistic review of curricula, particularly the Mechanical Engineering (ME) curriculum, which may benefit from some updating.  | <i>Medium term action (1-2 years)</i><br>An ad hoc ME curriculum renewal committee was struck in Fall 2022. Projected presentation to Faculty Council by Fall 2025.   | As in recommendation #1, we have advised MIE that resources are available from the Office of the Vice-Provost, Innovations in Undergraduate Education, such as Program Innovation Funds (PIF) and support from the Curriculum Development Specialist.   |
| 28 |   | "Research space: This was repeatedly brought up as a serious concern throughout the review team's visit. The faculty numbers have grown from 40 in 2000 to 66 today (including seven teaching stream faculty) with no increase in research space. The space crunch has led to undergraduate lab space being cannibalized by research. As a short-term measure we suggest, the Department consider renting space on or near campus. As a longer-term measure we recommend that the Department create a facilities plan that addresses the long-term needs of the Department, including the potential need to plan for a new building." | <i>Medium term action (1-2 years)</i><br>Signed a lease for 1000+ NASMs of new research and office space near the St. George campus. Occupancy expected June 2024. This will free up space in the Rosebrugh building, part of which is currently targeted for a new undergraduate mechatronics/manufacturing lab. | The Dean's Office recognizes that the Department will be addressing the review report recommendation regarding the lack of research space.<br><br>As described earlier, the Faculty is already engaged in a Master Space planning exercise and has been looking at a number of strategic opportunities that will help create new and better space for both teaching and research. |

### 3 Committee on Academic Policy & Programs (AP&P) Findings

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The spokesperson for the reading group reported that the review summary had accurately reflected the full review. The reading group reported that the Dean's administrative response had adequately addressed the issues identified by the review, however, asked the Department to further address the concerns around gender diversity in relation to graduate students, faculty hires, and support mechanisms for underrepresented faculty and students.

Markus Bussman, Chair of the Department of Mechanical & Industrial Engineering (MIE) responded that:

Regarding gender diversity, the department made offers to two female candidates in the past that declined the offers, resulting in men being hired. He reported that of the last seven hires, five were women. There were two searches for three positions currently underway, and diversity and gender diversity were a key priority.

From an undergraduate perspective, almost 40% of students entering engineering were women. However, he noted that within the master's programs and PhDs, the number of women decreased and faculty members in MIE were conducting a study to understand the reasoning and what could be done to change it.

There were two kinds of graduate students, one being funded research students that were recruited individually, and a professional master's program that was largely comprised of international applicants.

In the past year on the research side, the department had incentivized faculty members to proactively recruit for women students, enhance diversity and subsidize students entering MIE.

On the professional master's program, the department was working with the School of Graduate Studies to obtain data to identify the students they wished to recruit as this program was a high revenue earner. As such, the department would think about diversity to the extent that they could, but still had to ensure that they brought in enough students to reach targets.

The former interim chair launched an EDI committee in the last year and its focus was to think more broadly of how to implement various initiatives around equity, diversity, and inclusion in the department.

A small initiative for the professional master's students was recently created to focus on female students, and to foster an inclusive community.

A member commented that they faced similar challenges in the Faculty of Medicine, in terms of searches as well as the environment into which people enter, noting that both needed to be considered for successful recruitment of faculty diversity, and should be a dual focus.

No follow-up report was requested.

## 4 Institutional Executive Summary

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The reviewers highlighted that the department is performing at a very high level under current leadership, and academic programs are thriving and in high demand; undergraduate programs attract superior students, offer considerable flexibility, and were recently reaccredited for the maximum term; departmental research output is excellent and impressive hires have been made since the previous review; junior faculty enjoy strong mentorship and appear well-informed about tenure and career progression requirements; teaching stream faculty appear happy and optimistic about their career prospects, and are assigned formal mentors; staff are competent, with clearly defined roles and good morale; and the Faculty's encouragement of and support for entrepreneurial energy has placed the department in an "envious" financial position, providing additional support for graduate stipends and facilities refurbishments.

The reviewers recommended that the following issues be addressed: reviewing and updating the undergraduate Mechanical Engineering curriculum, and considering enhanced Artificial Intelligence offerings; monitoring the enrolment and progress of underrepresented groups in the undergraduate programs; addressing undergraduate laboratory space needs; exploring approaches to enhance undergraduate advising and supports; tracking undergraduate student progress and career outcomes; exploring central recruiting efforts for the MSc and PhD programs; strategically considering the needs of a larger MEng contingent and potential impacts on departmental operations, staffing, culture, and research; monitoring the enrolment and progress of underrepresented groups in the graduate programs; exploring approaches to enhance supports for graduate students; tracking graduate student performance measures and outcomes; developing more transparent communications about faculty advancement and enhancing faculty mentorship; developing a formal strategy to grow and support a diverse faculty complement and student body, and developing and communicating support structures and mechanisms to address concerns of underrepresented and female faculty; enhancing connections with industry, government and foundations, and strategically growing the impact of affiliated research centres; and developing a long-term strategic plan to address key challenges on the horizon.

The Dean's Administrative Response describes the Faculty and unit's responses to the reviewers' recommendations, including an implementation plan for any changes necessary as a result.

## 5 Monitoring and Date of Next Review

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The Dean will provide an interim report to the Vice-Provost, Academic Programs midway between the 2021-2022 review and the year of the next site visit on the status of the implementation plans.

The next review of the Department of Mechanical & Industrial Engineering will be commissioned in 2027-2028.



## 6 Distribution

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On June 30<sup>th</sup> 2024, the Final Assessment Report and Implementation Plan was posted to the Vice-Provost, Academic Programs website and the link provided by email to the Dean of the Faculty of Applied Science and Engineering, the Secretaries of AP&P, Academic Board and Governing Council, and the Ontario Universities Council on Quality Assurance. The Dean provided the link to unit/program leadership.