UNIVERSITY OF TORONTO
FACULTY OF APPLIED SCIENCE & ENGINEERING

Report No. 3790

MEMORANDUM

To: Executive Committee of Faculty Council (April 8, 2025)
Faculty Council (April 29, 2025)

From: Professor Julie Audet
Vice-Dean, Graduate Studies

Date: March 26, 2025

Re: Closure of Master of Health Science (MHSc) in Clinical Engineering

REPORT CLASSIFICATION

This is a major policy matter that will be considered by the Executive Committee for endorsing and forwarding to Faculty Council for vote as a regular motion (requiring a simple majority of members present and voting to carry).

BACKGROUND

The Master of Health Science (MHSc) in Clinical Engineering, offered by the Institute of Biomedical Engineering (BME), was created in 1984 with the primary objective of educating engineers on how to better manage an influx of technology into Canada's health care facilities, in a time when that technology was in a field somewhat unprepared to deal with it. The MHSc program focus was centred on the impact of technological resources in modern hospitals, and how they met the specialized requirements of the hospitals, the medical professionals, and the patient problems encountered.

PROPOSED

It is proposed to close the Master of Health Science (MHSc) in Clinical Engineering due to declining program interest in a changing academic landscape and to reduce overlap with BME's existing MASc and MEng programs.

CONSULTATION PROCESS

BME conducted a series of consultations with stakeholders and received consistent support from students, faculty and divisional leadership to close the MHSc program. The deans of BME's partner divisions, the Temerty Faculty of Medicine and the Faculty of Dentistry, also support the closure of the MHSc.

The proposal was approved by the Faculty's Engineering Graduate Education Committee in March 2025.

RECOMMENDATION FOR COUNCIL

THAT the Master of Health Science (MHSc) in Clinical Engineering, as described in Report 3790, be closed effective August 31, 2025.

University of Toronto Proposal

Closure of an Existing Program or Program Structure (Graduate or Undergraduate):

Master of Health Science (MHSc) in Clinical Engineering

Closure proposed:	Master of Health Science (MHSc) in Clinical Engineering
Department/unit if applicable:	Institute of Biomedical Engineering (BME)
Faculty/academic division:	Applied Science & Engineering (FASE)
Department/unit contact:	Prof. Hai-Ling Margaret Cheng, Associate Director, Graduate Studies (BME) Jason Wen, Education Officer (BME)
Faculty/academic division contact:	Prof. Julie Audet, FASE Vice-Dean, Graduate Caroline Ziegler, FASE Governance & Programs Officer
Date admissions administratively suspended:	January 1, 2021
Effective date of full closure of program:	August 31, 2025
Version date:	March 26, 2025

Framework for UTQAP Closures

UTQAP processes support a structured approach for creating, reflecting on, assessing, and developing plans to change and improve academic programs and units in the context of institutional and divisional commitments and priorities.

The University of Toronto (U of T), in its *Statement of Institutional Purpose* (1992), articulates its mission as a commitment "to being an internationally significant research university, with undergraduate, graduate, and professional programs of excellent quality." Thus “quality assurance through assessment of new program proposals and review of academic programs and units in which they reside is a priority for the University…:

> The quality of the scholarship of the faculty, and the degree to which that scholarship is brought to bear in teaching are the foundations of academic excellence. More generally, all of the factors that contribute to collegial and scholarly life —academic and administrative complement, research and scholarly activity, infrastructure, governance, etc.,—bear on the quality of academic programs and the broad educational experience of students. (*Policy for Approval and Review of Academic Programs and Units* (2010))

The University's approach to quality assurance is built on two primary indicators of academic excellence: the quality of the scholarship and research of faculty; and the success with which that scholarship and research is brought to bear on the achievement of Degree Level Expectations.

These indicators are assessed by determining how our scholarship, research and programs compare to those of our international peer institutions and how well our programs meet their Degree Level Expectations.

Program and Program Structure Closure

Proposals for program closures are vehicles of academic change. The University of Toronto views the closing of academic activities as a normal and positive part of quality assurance and program evolution. There are a number of possible reasons for closing a program including low enrolment, a changing disciplinary landscape and poor quality of the academic program. These reasons may be articulated in external review reports or may be identified by members of the University community.

This template (last updated by the Office of the Vice-Provost, Academic Programs on May 16, 2024) aligns with UTQAP requirements and will help to ensure that all evaluation criteria established by the Quality Council are addressed in bringing forward a proposal. Divisions may have additional requirements that should be integrated into the proposal.

Approvals and Governance

Steps	**Dates**
Decanal (Dean or designate) sign-off	January 2025
VPAP sign-off	March 26, 2025
FASE Engineering Graduate Education Committee (EGEC) approval	March 18, 2025
Faculty/Divisional Council approval	April 29, 2025
AP&P (approval of program closures: undergraduate specialists/majors; diplomas)	May 13, 2025
Academic Board (approval of degree, graduate program, joint program closures)	May 29, 2025
Executive Committee of Governing Council (confirms degree, graduate program, joint program closures)	June 12, 2025
Inclusion in annual report to Quality Council	July 2025

1. Executive Summary

- *Provide a brief summary of the closure being proposed.*

This proposal is to close the Master of Health Science (MHSc) program in Clinical Engineering, offered through the Institute of Biomedical Engineering.

In addition to the MHSc, the Institute of Biomedical Engineering (BME) offers a Master of Applied Science (MASc), Doctor of Philosophy (PhD), and Master of Engineering (MEng). The MASc and PhD programs focus on research, while the MEng program is a professional program designed to provide a hands-on/internship component that can be conducted in an industry, a hospital, or a research lab setting. Due to declining program interest in a changing academic landscape, and to reduce overlap with other master's programs, the MHSc program, which has already been administratively suspended since January 2021, will close.

2. Academic Rationale

- *Discuss the academic rationale for the closure including alignment with the unit's academic plan and connection to any previous reviews, including any resource implications.*

The Master of Health Science (MHSc) program in Biomedical Engineering is offered by the Institute of Biomedical Engineering (BME), an Extra-Departmental Unit Type A (EDU:A). The Faculty of Applied Science & Engineering is the lead division of BME and the Faculty of Dentistry and Temerty Faculty Medicine are partner divisions. Created in 1984, the MHSc program had the primary objective of educating engineers on how to better manage an influx of technology into Canada's health care facilities, in a time when that technology was in a field somewhat unprepared to deal with it. The MHSc program focus was centred on the impact of technological resources in modern hospitals, and how they met the specialized requirements of the hospitals, the medical professionals, and the patient problems encountered.

In 2001, BME launched the Master of Applied Science (MASc) and Doctor of Philosophy (PhD) programs to advance BME's curriculum and research themes. In 2017, BME launched the Master of Engineering (MEng) program to meet the growing demand of learners in biomedical devices, commercialization, and entrepreneurship. Several educational aspects of the MHSc program were also blended into the MEng, MASc, and PhD curriculums, which continue to evolve to spearhead the expansion and transformation of biomedical engineering in Canada.

In 2019, the MHSc program underwent a minor modification to align the admission and program requirements internally across all degrees offered at BME, although it was clear that both the interest in and the impact of the MHSc program had diminished over

time. With three additional master's programs concurrently operating at BME, the value of the MHSc program was investigated to ensure educational alignment through a series of consultations with stakeholders. It was concluded that the resources needed to maintain the MHSc program had outpaced its value. Importantly, the clinical engineering field, for which the MHSc program was originally designed, had changed, and would be better served through BME's other existing program offerings.

As part of the 2021 UTQAP review of BME, the reviewers identified that between 2016 and 2020, the MASc and PhD programs offered experienced growth of 45% and 28%, respectively. In contrast, enrolment in the MHSc program decreased significantly (-89%) in the same period. The reviewers felt reflected that students had a stronger interest in the design and engineering of new medical devices rather than the clinical use of existing devices. The Dean's administrative response to the review report confirmed that that the MHSc would close.

3. Impact of Closure on Divisional and Other Programs/Units

- *Discuss the impact on the nature and quality of the division's program of study, including the impact of closure on other units including inter-divisional and inter-institutional agreements/contracts.*

There will be no impact of closure on divisional and other programs/units. The BME MHSc program has been administratively suspended since January 2021.

4. Impact on Students

- *Provide the current enrolment showing breakdown by year of study in the program or option being closed.*

Table 1: Graduate Breakdown

	Year	**Year**	**Year**	**Year**	**Year**	**Year**
	# of students					
Current Master's enrolment	0	0	0	0	0	0

- *Referring to the table above, discuss the impact on and accommodation of any students currently enrolled in the program.*

There is no impact on students. No students have been registered in the MHSc program after 2019, and the BME MHSc program has been administratively suspended since January 2021.

5. Consultation

- *Discuss consultation with affected divisions, units, faculty and students.*

BME conducted a series of consultations with stakeholders and received consistent support from students, faculty, and divisional leadership about closure of the MHSc program. The meetings occurred between 2018 and 2021, and the key takeaways from these meetings were as follows:

Consultation with students

Students were initially consulted in March 2018 to investigate the state of the MHSc program. Relative to other master's programs at BME, MHSc students expressed concerns about several challenges, including a longer program completion time, unequal access to funding, and limited research opportunities. Subsequent student consultations were held in 2021 with both students and alumni, and additional barriers to student success were identified, such as difficulties in securing clinical internships and conflicting demands on student time between research and placement obligations. Alumni also recognized that the clinical engineering field had changed over time and had blended into various aspects of biomedical engineering and thus may be better positioned as a sub-theme of the BME curriculum instead of a separate program. Overall, student consensus was in favour of closing the MHSc program.

Consultation with faculty

BME faculty members were consulted on numerous occasions including at a faculty retreat in May 2019. The faculty body recognized that interest and enrollment in the MHSc program had both declined. Given limited resources, BME would be better served by closing the MHSc program and redirecting resources to other programs. BME faculty members were subsequently notified about the MHSc program suspension in March 2021; faculty members were again consulted, and they reaffirmed their support for the MHSc program closure.

Consultation with Deans

The Deans of the BME partner divisions, the Temerty Faculty of Medicine and Faculty of Dentistry were contacted in August 2021. Dean Houston (Temerty) and Dean Haas (Dentistry) both indicated support for closure of the MHSc program.

Internal program review

In November 2021, a special faculty committee was created to comprehensively review the MHSc program. After consideration of program performance indicators and collective feedback, the committee unanimously recommended the closure of the MHSc program. In a report to Dean Yip (Engineering), the committee cited fundamental weaknesses in the MHSc program (for example, declining interest and recognition of the clinical engineering field) as impetus for closure. Importantly, there was significant overlap between the MHSc program and two other BME master's programs (MASc and

MEng): the once core components of the MHSc program have, over time, integrated and evolved within the MASc and MEng curriculums. Thus, the need to maintain a separate MHSc program had been eliminated, and the unit would be better served by redirecting resources elsewhere.