



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

Program(s):	Biomedical Engineering, M.A.Sc., Ph.D. Clinical Engineering, M.H.Sc. Collaborative Program in Biomedical Engineering
Division/Unit:	Institute of Biomaterials and Biomedical Engineering, Faculty of Applied Science and Engineering
Commissioning Officer:	Dean, Faculty of Applied Science and Engineering
Reviewers (Name, Affiliation):	<ol style="list-style-type: none">1. Dr. Monique Frize, Professor Emerita, School of Information Technology and Engineering (SITE), University of Ottawa; Distinguished Professor, Department of Systems and Computer Engineering, Carleton University; Fellow of the Canadian Academy of Engineering; Officer of the Order of Canada2. Dr. Kevin Healy, Professor and Chair, Department of Bioengineering; Professor, Materials Science & Engineering, University of California, Berkeley; Fellow of the American Institute for Medical and Biological Engineering3. Dr. Craig Henriquez, Professor of Biomedical Engineering and Computer Science and Chair, Department of Biomedical Engineering; Co-Director, Center for Neuroengineering, Pratt School of Engineering, Duke University; Fellow of the American Institute for Medical and Biological Engineering4. Dr. William Wagner, Professor, Departments of Surgery, Bioengineering, and Chemical Engineering; Director of the McGowan Institute of Regenerative Medicine, UPMC/University of Pittsburgh Schools of the Health Sciences; Fellow of the American Institute for Medical and Biological Engineering
Date of review visit:	November 19 – 20, 2012
Date reported to AP&P:	April 16, 2013

1 Outcome

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

2 Significant Program Strengths

- The quality of the doctoral programs, reflected in the large number of first-authored student publications and presentations at international meetings
- Strong clinical engineering training offered to students
- Excellent, internationally-recognized faculty, engaged in pioneering research
- The unique simulation laboratory facilities
- Excellent partnerships with associated Faculties, hospital partners, translational organizations and local industry

3 Opportunities for Program Improvement and Enhancement

The reviewers recommended that the following be considered:

- Defining critical knowledge and ensuring an appropriate curriculum is in place for each of the research areas, including relevant training in ethics
- Finding ways to bring students together to support career and professional development, including exposing them to international biomedical engineering research
- Increasing staff support for the collaborative program to ensure students have access to appropriate advising
- Further developing strategies to market the programs and recruit international students, including clearly identifying available degree programs
- Addressing the challenges that space restrictions pose, in the short and long terms

4 Implementation Plan

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

- Short Term (12 months)
 - Ensuring an appropriate curriculum is in place to support all research areas
 - The Institute will reconfigure the course selection list and realign requirements
 - Supporting students' professional development
 - The Institute will provide professional development opportunities for students through several annual events with alumni (including a career day), collaborating with the M.H.Sc. in Clinical Engineering program and sharing information about international research opportunities
 - Supporting the collaborative program
 - The Institute will work with collaborating graduate units to ensure that opportunities and resources for collaborative students are balanced between IBBME and the partner units, and leveraged to their fullest potential
 - The Institute will improve communication with students in the collaborative program so that they better understand the resources available to them when selecting a home unit

- Developing program marketing and international student recruitment
 - The Institute will work to improve communication with students and a wider, external audience via a variety of new tools and an enhanced website
 - The Institute will match international student applicants with geographically-linked scholarships
- Medium Term (1-2 years)
 - Ensuring an appropriate curriculum is in place
 - The Institute will continue developing a proposal for a combined undergraduate / M.Eng. program
 - The Institute will identify and offer additional research and medical ethics training to students
 - Supporting students' professional development
 - The Institute, in conjunction with the Offices of Advancement in the Faculties of Applied Science and Engineering, Medicine, and Dentistry, will work to raise money to establish research exchange funds, enabling students to travel to other laboratories to learn about new research methods and expertise
 - The Institute will continue to support the Biomedical Engineering Students Association (BESA) and create new career development opportunities
 - Supporting the collaborative program
 - The Institute will identify resources in support of the collaborative program
 - The Institute will consider addressing the opportunity for some internal awards and for student affairs support drawn from IBBME's operational funds
 - Developing program marketing and international student recruitment
 - The Institute will establish partner University agreements with key international jurisdictions
 - The Institute will work to internationalize IBBME's research funding and activity
 - Addressing space restrictions
 - The Institute will work with the Deans of the Faculty of Applied Science and Engineering and the Faculty of Medicine, and with existing partner departments (14 collaborative departments and eight teaching hospitals) to identify swing or rental space and capitalize on under-utilized and/or available areas to support future activities in the program areas
- Longer Term (3-5 years)
 - Addressing space restrictions
 - The Institute will continue to seek partnerships in new capital funding projects conceived by the Faculties of Applied Science and Engineering, Medicine, and Dentistry
 - The Institute will seek such partnerships with the Faculties of Arts and Science, and Pharmacy, with whom it shares collaborative graduate programs
 - The Institute has recently launched a five-year alumni and advancement strategic plan and will continue to work with the Advancement Offices in Engineering, Medicine and Dentistry to support capital fundraising efforts

- Developing program marketing and international student recruitment
 - The Institute will work to increase the percentage of international students from 10% to 25% over the next five years
 - With the Office of Advancement in the Faculty of Applied Science and Engineering, the Institute will grow scholarship opportunities for international students

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

5 Executive Summary

The reviewers identified the programs' strengths as the international profile of doctoral students; the clinical engineering training offered to students; the internationally-recognized, excellent faculty; the unique simulation laboratory; and the programs' excellent partnerships with associated Faculties, hospital partners, translational organizations and local industry. The reviewers recommended that the following issues be addressed: ensuring an appropriate curriculum is in place to support all research areas; supporting students' career and professional development; increasing support for the valuable collaborative program; developing strategies to market the programs and recruit international students; and addressing challenging space restrictions. The Institute will reconfigure the course selection list and realign requirements. The Institute will facilitate new events and professional development opportunities for students. The Institute will ensure that collaborative students understand the resources available to them. The Institute and the next IBBME Director will work with existing partner departments to identify current and future opportunities for space in their facilities and to share common core faculty recruits. The Institute will work to improve communication with all students and a wider, external audience via a variety of new tools and an enhanced website. The Committee on Academic Policy and Programs (AP&P) concluded that the Decanal response adequately addressed the review.