



**Council of the Faculty of Applied Science & Engineering
Minutes of the Meeting of October 31, 2023**

MEMBERS: Ning Yan (Interim Speaker), Chris Yip (Dean), Ravi Adve, Dionne Aleman, Cristina Amon, Julie Audet, Aereas Aung, Mohammed Basheer, Chris Beck, Shlomo Bibas, David Boroto, Helen Bright, Markus Bussmann, Liane Catalfo, Arthur Chan, Ron Chiong, Alan Chong, Will Cluett, Shai Cohen, Tom Coyle, Joe Dai, Michelle Deeton, Stark Draper, Matthew Du, Ryan Fang, Ege Feyzioglu, Diane Giang, Michael Guerzhoy, Sarah Haines, John Harrison, Marianne Hatzopoulou, Angela Henshilwood, Jenny Hill, Ken Hilton, Greg Jamieson, Fatemeh (May) Jazinizadeh, Parker Johnston, Shannon Jones, Dawn Kilkenny, Daeho Kim, Don Kirk, Deepa Kundur, Katy Kwong, George Liu, Xilin Liu, Allison MacKay, Gaurika Mahajan, Sam Mantenuto, Mark Rittinger, Elham Marzi, Kasra Modares, Emily Moore, Erika Narimatsu, Milos Popovic, Adham Ragab, Asim Rahman, Aryan Rezaei Rad, Jonathan Rocheleau, Lisa Romkey, Jonathan Rose, Cindy Rottmann, Miko Samson, Philipp Seiler, Agnes So, Theodore Soong, Marisa Sterling, Micah Stickel, Deborah Tihanyi, Hamid Timorabadi, John Walker, Elizabeth Whitmell, Kaitlyn Wong, Kennice Wong, Natalie Wong, Yu Zou

SECRETARIAT: Caroline Ziegler (Secretary), Alex Schroen (Moderator)

GUESTS: Chris Brown, Sharon Brown, Emma Davidson, Leanne Dawkins, Khuong Doan, Pierina Filippone, Roger Francis, Shilpa Gantotti, Rodney Gensell, Leslie Grife, Krysta Halliwell, Christina Heidorn, Oje Izirein, Julie Kang, Minsoo Koh, Sherry Lin, Andrea Luna Yong, Teresa Miniaci, Don Newton, Dan Pettigrew, Zeeshan Rayees, Ingrid Schvarczkopf, Frank Scornaienchi, Peter Serles, Saheb Tabassum, Tristan Tapscott, Alex Tichine, Nefeteria Wickham

1. Speaker's Welcome

Interim Council Speaker Ning Yan called the first Faculty Council meeting of 2023-2024 to order at 12:10 pm, welcoming new Council members in GB202 and online. She explained that she will be the Speaker while Jun Nogami is on leave this academic year.

The Speaker acknowledged the land on which the University of Toronto operates, reviewed protocols for the hybrid meeting and encouraged members to review the orientation slides on the Faculty Council webpage.

2. Approval of Agenda

The agenda and reports were distributed on October 20 and updates to the memorial tribute and standing committee appointments were distributed on October 26.

There was no discussion and on a regular motion duly moved, seconded and carried, the agenda was approved.

3. Introduction of New Faculty Members

New faculty members Aereas Aung and Caitlin Maikawa of Biomedical Engineering; Mohammed Basheer of Civil & Mineral Engineering; Xilin Liu of Electrical & Computer Engineering; and Fatemeh (May) Jazinizadeh of Mechanical & Industrial Engineering were introduced by their respective chairs and directors.

4. Adoption of the Minutes of Previous Meetings

No errors or omissions were noted in the minutes of the April 26, 2023 Council meeting and on a regular motion duly moved, seconded and carried, the minutes were approved.

5. Memorial Tribute

Deepa Kundur, chair of Electrical & Computer Engineering, read the following memorial tribute in honour of University Professor Emeritus Walter Murray Wonham.

Be it resolved –

THAT the Council of the Faculty of Applied Science & Engineering record with deep regret the death on May 14, 2023 of University Professor Emeritus Walter Murray Wonham.

Professor Walter Murray Wonham was a giant in the field of control systems and garnered international attention for his work. In addition, he was polylingual; a bibliophile; a sailor, skier and tennis player; and he held a great love for traditional Chinese literature and poetry.

Murray was born in 1934. He married Anne Wonham (née Hale) and has two daughters, Cynthia and Marjorie. After graduating high school in Montreal, Murray studied Engineering Physics at McGill University, earning his degree in 1956. He followed that with a PhD in Control Engineering from the University of Cambridge in 1961.

Beginning in the 1960s, he worked with several institutions, including those at Purdue University and Brown University, as well as NASA. During this time, he furthered his research on stochastic filtering and control, developing the ‘Wonham filter’ — cited today by researchers in quantum systems — along with new results on Matrix Riccati equations and the separation theorem of stochastic control, now found in textbooks around the world. Murray’s research then changed focus, turning to linear multivariable control, and in 1967 he was the first to prove the famous pole assignment theorem, which has become a staple of undergraduate courses on state space control, including courses in the ECE department.

By 1970, Murray had moved back to Canada, taking a position in U of T as a faculty member in the Systems Control Group in the then-named Department of Electrical Engineering. Early in his U of T career, he pioneered the geometric approach to linear time-invariant (LTI) systems and developed the internal model principle. His success produced a new level of understanding along with valuable tools, but it also opened up new problems, inspiring a generation of control theorists to try and replicate in the nonlinear domain what Murray had achieved in the linear.

It was clear with each of Murray's research publications that he was a deep thinker and visionary. This culminated in 1979 with "arguably one of the best books ever written in control theory," says ECE Professor Manfredi Maggiore, referring to *Linear Multivariable Control: A Geometric Approach*, which was subsequently issued in three editions and translated into Russian and Chinese. The running joke, originated by Murray's former student and collaborator Professor Emeritus Bruce Francis, is that you could teach an entire graduate course out of the book's Chapter 0: 'Mathematical Preliminaries.'

In the spring of 1979, Murray taught Peter Ramadge, now a professor at Princeton University, who remembers the elegant simplicity Murray wielded to resolve fundamental concepts and important questions: "It was something that deeply resonated with me," says Ramadge. He also recalls Murray enjoying the occasional lunch with students at a local Chinese restaurant. Many came away from these lunches with a better understanding of what makes good research and how to think about research problems.

In the 1980s, Murray initiated the field of supervisory control of discrete-event systems along with Ramadge (who had become his doctoral student). Professor Shahin Hashtrudi Zad of Concordia University, looking back on the years as Murray's student, notes his signature insightfulness, how he could find connections other researchers overlooked: "Professor Wonham's work showed that the two theories, geometric control and supervisory control, share a lot of similarities, especially from an algebraic point of view."

Murray's thinking in this area was eventually outlined in books, the first published in 2005 with Chuan Ma, a second in 2015 with Kai Cai. For many years Murray's graduate course notes on this topic were made available for free online and have greatly influenced generations of researchers. Eventually, in 2019, they became his final book, co-authored again with Kai Cai, entitled *Supervisory Control of Discrete-Event Systems*.

During his time at U of T, Murray held visiting lectureships across the globe, including academic institutions and universities in the United States, China, Germany, India and Mexico. Combining his research work with his love of travel gave him great pleasure, and he would regale everyone on his return of his adventures with host students. In 1996 Murray was appointed University Professor, and he retired in 2000 as University Professor Emeritus at U of T.

Throughout his life, Murray received a plethora of awards and recognitions. He was made a Fellow of the Royal Society of Canada and a Life Fellow of the Institute of Electrical and Electronics Engineers (IEEE). He was a Foreign Member of the U.S. National Academy of Engineering and an Honorary Professor of Beihang University, then-known as the Beijing

University of Aeronautics and Astronautics. In 1987 he received the IEEE Control Systems Science and Engineering Award and in 1990 he was the Brouwer Medallist of the Netherlands Mathematical Society. After retirement, he remained an active and engaged researcher and supervisor of graduate students. In 2020 he was awarded the Giorgio Quazza Medallist of the International Federation of Automatic Control.

Murray was a true gentleman whose pursuit of truth was an aesthetic one, a principle he embraced in all facets of his life. His door was always open with a note that read simply “knock and enter,” and his brilliance and his teaching shaped many students into leaders in their fields. Jonathan Ostroff of York University says, “He demanded my best academic work but also had a gracious understanding of my personal life,” a sentiment echoed by Murray’s colleague and Professor Emeritus Raymond Kwong: “I have lost not only an outstanding colleague but also a personal friend.” Murray will be deeply missed by all those who knew him.

Be it further resolved –

THAT this tribute to University Professor Emeritus Walter Murray Wonham be inscribed in the minutes of this Council meeting, and that copies be sent to his family as an expression of the respect and gratitude of the members of this Council.

The Speaker assumed concurrence with these resolutions and Council observed one minute of silence in honour of Professor Wonham.

6. Report of the Dean

Dean Chris Yip welcomed all to Council and acknowledged new chairs and directors, namely Natalie Enright Jerger of Engineering Science, Marianne Hatzopoulou of Civil & Mineral Engineering, Milos Popovic of Biomedical Engineering, and Greg Jamieson of the Institute for Studies in Transdisciplinary Engineering Education & Practice (acting). He thanked members for a phenomenal start to the academic year, in particular the Engineering Society (EngSoc), and provided the following remarks.

(a) Recruitment and Admissions

This year we welcomed just under 1,400 first year students to our programs, 38% of whom are women. Enrolment has been increasing for international students as well, drawing now from India, Japan, Malaysia and Indonesia.

(b) External Reviews

The FASE provostial review visit will occur on December 4-6, 2023. The draft Engineering self-study is posted online and has been sent to the Provost’s Office for feedback. The external review team includes Nora de Leeuw, Executive Dean, Faculty of Engineering and Physical Sciences, University of Leeds; Jim A. Nicell, former Dean, Faculty of Engineering, McGill University; and Ishwar Puri, Senior Vice-President of Research and Innovation, University of Southern California and former Dean of McMaster Engineering.

Engineering Science's external review visit was completed on October 16-17. We have received the review report and will forward it to the Vice-Provost, Academic Programs who will request our administrative response to recommendations in the report. The external review visit of the Department of Civil & Mineral Engineering will be on November 2-3. The Mechanical & Industrial Engineering administrative response regarding their June 2022 visit was well received by the Committee on Academic Policy & Programs last week. Their review has concluded. External reviews of the Cross-Disciplinary Programs Office and minors and certificates, Materials Science & Engineering, and Aerospace Studies are scheduled for the winter term.

These reviews are important to the University and province for quality assurance and are extremely valuable to the units and Faculty as a critical reflection on our progress and a focus for future plans. Thank you to those participating in the reviews and those who helped prepare.

(c) Academic Plan

As many are aware, our academic planning cycle has been extended for a year. The Vice-Dean, Strategic is managing this process and her office will begin consultations in the upcoming months.

(d) Graduation Breakfast and Convocation

Convocations for the Bachelor of Applied Science, Bachelor of Applied Science in Engineering Science, Master of Engineering, Master of Engineering in Cities Engineering and Management, Master of Engineering in Design and Manufacturing, Master of Health Science (Clinical Engineering), Master of Applied Science, and Doctor of Philosophy will be on November 9 from 10:00-11:30 am in Convocation Hall. A graduation breakfast, hosted by Advancement, will be held from 7:30-9:30 am in the Bahen Atrium.

(e) The Pit Survey

The Provost's office, Dean's office and the Engineering Society have formed a partnership to renovate "the Pit" in the Sandford Fleming basement. A survey asking participants to vote on two renderings of the space – to fill it in or to retain it – closed yesterday. Over 500 responses were received. Accessibility and cleanliness are key.

(f) Annual Report

Two recent publications, *U of T Engineering Impact Report 2023: Celebrating 150 Years of Impact*, and *By the Numbers 2023*, are available on the Faculty's website. These describe the Faculty's progress and achievements in graduate studies, undergraduate studies and research. An impact deck of approximately 100 slides has also been created that summarizes the *Impact Report*. This is available for use for external presentations. Thank you to Strategic Communications for pulling these items together.

(g) Advancement Updates

The 150th Anniversary open house here on campus was a success, with approximately 700 in attendance. The day included amazing lectures, student demonstrations, and a tour of some of the engineering spaces. Thank you to everyone involved in the planning and implementation of

the event, and thanks to all who participated. We anticipate a very busy fall with continued enthusiasm around the 150th Anniversary.

(h) Travel Update

Recent travel includes a trip to California to meet with alumni in the region. A trip to Hong Kong is planned for November, where a celebration of the Faculty's 150th Anniversary will be held for alumni there.

The Speaker thanked the Dean for his report. There was no discussion.

7. Information Reports

(a) Engineering Graduate Education Committee Update

Lisa Romkey, chair of the Engineering Graduate Education Committee, presented Report 3751, which describes approval of CHE3010 and CHE3012, a modification to MSE1040, and a name change involving CHE1135.

There was no discussion, and the report was received for information.

(b) Expanded Definitions for Type C Exams

Arthur Chan, chair of the Undergraduate Assessment Committee, presented Report 3748, regarding expanded definitions of "Type C" exams. This exam type was introduced in Report 3588 and approved by Council in April 2018 to represent a standard and structured way for instructors to indicate examinations in which an aid sheet is permitted. There has since been ambiguity around what a "handwritten" aid sheet means which has resulted in confusion and inconsistent implementation and has in some cases led to inequitable application. The Undergraduate Assessment Committee proposes to update the definition of Type C exams by creating three subtypes that will provide additional clarity.

During discussions, Professor Chan confirmed that this change will be implemented for the fall of 2023.

The report was received for information.

(c) Further Clarification of Policy regarding Return of Graded Work Prior to Drop Deadline

Arthur Chan, chair of the Undergraduate Assessment Committee, presented Report 3749. In February 2023, Council approved Report 3739, changes to academic regulation Section XI, subsection 4a to clarify that one or more pieces of session work cumulatively worth at least 10% of the final course grade shall be returned to the class prior to the last day for withdrawal from the course without academic penalty. Since then, students have raised concerns that enabling multiple smaller assignments to meet the 10% requirement may not provide a sufficient indication of their performance. The Undergraduate Assessment Committee agrees

that “closely supervised work” would provide a better indication of student performance and proposes to update the policy accordingly.

During discussions, Professor Chan confirmed that this policy will come into effect in Winter 2024. A member stated that the 10% return by the drop date is University policy, and that the Faculty is strengthening this rule.

The report was received for information.

(d) Report of the Academic Appeals Board (Undergraduate), September 2022-September 2023

Don Kirk, chair of the Academic Appeals Board (Undergraduate), presented Report 3753, a summary of appeals and dispositions for the 2022-2023 academic year, and commented on updates, trends, and observations within academic appeals.

He stated that the number of appeals has been rising and cases are increasingly complex with a larger volume of material. These cases are taking longer, and it is difficult for Board members to have the availability to meet with students. An increasing number of students are requesting deferred exams, but these are exceptional circumstances in our Faculty and very few are granted for various reasons.

Appeals are held *in camera*, but students may be reticent to discuss personal matters. The Board tries to ensure that all its members are culturally aware and that the appellant is made comfortable when discussing their scenario.

Professor Kirk thanked faculty and student members of the Board, as well as the recording secretary, whose support was exceptional.

The report was received for information.

8. Standing Committee and Academic Appeals Board (Undergraduate) Appointments, 2023-2024

The Speaker presented Report 3752 Revised, membership lists for the Academic Appeals Board (Undergraduate) and the eight standing committees of Council for the current academic year. These lists are posted on the Faculty Council webpage and updated as required.

9. Report of the Engineering Alumni Network Awards Committee, 2022-2023

Liane Catalfo, president of the Engineering Alumni Network, (EAN) presented Report 3750, recommendations for the 2022-2023 Engineering Alumni Medal, Malcolm McGrath Alumni Achievement Award, 2T5 Mid-Career Award, 7T6 Early-Career Award, and L.E. (Ted) Jones Award, as well as inductees in the Engineering Hall of Distinction. The annual EAN Awards Ceremony will be held on November 2 in the Great Hall at Hart House.

10. Other Business

There was no other business.

11. Accessibility Services and Accommodated Testing Services regarding Student Support

Emma Davidson of the University's Accommodated Testing Services (ATS) and Krysta Halliwell of U of T Accessibility Services presented on student support.

ATS coordinates accommodations for all timed assessments for students who are registered with Accessibility Services on the St. George Campus. It works in partnership with all Faculties, programs, and course delivery options to support the community in meeting students' accommodation needs, specifically the coordination of test/exam accommodations for students with approved accommodations. Testing accommodation can include extra writing time, adaptive furniture, alternate exam formats, adaptive software, stopped-clock breaks and assistive staff.

Accessibility Services collaborates with faculty, staff and registered students to provide individualized accommodations that meet the needs of students while ensuring the academic integrity of the University. This includes intake, documentation review, accommodations plan development and approval, service referral and continuous management of students' accommodations.

It was stated during discussions that instructors sometimes leave out certain aids, such as rulers, aid sheets and calculators, when submitting test/exam details to ATS. This can make exams an even more stressful experience for students. To help prevent this, there is a prompt in the system that asks instructors if there are any allowed aids, giving examples and options to check off. This is useful in case there is conflicting information from students and instructors about what is allowed to be in the exam room. If instructors encounter a problem with an exam during business hours, they can call or email the invigilator office to reach staff who work directly with students.

The presenters are at Council to raise awareness of their services and to emphasize how seemingly small issues can impact students. They can collaborate with Faculties to improve their systems and avoid miscommunications that may arise during the process. They have also developed online Faculty Guidelines on Accommodations which deal with the most common issues like extensions. Council members are encouraged to contact ATS and Accessibility Services to discuss their needs or what might work for their Faculty.

12. Date of Next Meeting

The next Faculty Council meeting is on December 7, 2023.

13. Adjournment

The meeting was adjourned at 1:42 pm.

/cz
11/21/2023 1:16 PM