



**Minutes of the Faculty Council
Meeting of December 12, 2017
Michael E. Charles Council Chamber (GB 202)**

PRESENT

Doug Reeve (Speaker)
Raviraj Adve
Tania Albarghouthi
Dionne Aleman
Grant Allen
Maedeh Amirmaleki
Cristina Amon (Dean)
Jason Anderson
Philip Anderson
Julie Audet
Joe Baptista
Jason Bazylak
Tim Bender
Evan Bentz
Chris Bouwmeester
Markus Bussmann
Michael W. Carter
Ariel Chan
Warren Chan
Hai-Ling Margaret Cheng
Yu-Ling Cheng
Samantha Cheung
Alan Chong
Lee Clement
James (Jim) Courtney
Tom Coyle
Jim Davis
Nikolai DeMartini
Levente L. Diosady
Khuong Doan
Stark Draper
Natalie Enright Jerger
Greg Evans
Jennifer Farmer
Ramin Farnood
Carolyn Farrell
Jason Foster
Seyed-Arman Ghaffari-Zadeh
Krisztina Harmath
Greg Jamieson

Dawn Kilkenny
Penny Kinnear
Don Kirk
Mark Kortschot
Frank Kschischang
Deepa Kundur
Elias Kyriacou
Andrew Lau
David Lie
Antonio Liscidini
Hugh T. Liu
Don MacMillan
Paul Malozewski
Elham Marzi
Thomas H. North
Vladimiro Papangelakis
David Philpott
Nelly Pietropaolo
Saif Rjaibi
Taras Romancyshyn
Lisa Romkey
Stephanie Rose
Vahid Sarhangian
Kaela Shea
Patricia Sheridan
Molly Shoichet
Craig Simmons
David Sinton
Brent Sleep
Kenneth Smith
Gillian Sneddon
Micah Stickel
Jonathan Swyers
Zeb Tate
Deborah Tihanyi
Hamid Timorabadi
Olev Trass
Chirag Variawa
Lydia Wilkinson
Willy Wong
Victor Xin

Ning Yan
Paul Yoo
Wei Yu

REGRETS

Jordan Carrette
Surath Gomis
Jane Illarionova
Bryan Karney
Brenda McCabe
Mahyar Mozaffari
Graeme Norval
Daniel Posen
Kayla Steadman
Sofia Tijanac

GUESTS

Helen Bright
Chris Brown
Sharon Brown
Geoff Carter
Brian Coates
Dani Couture
Rossdan Craig
Leanne Dawkins
Leslie Grife
Cori Hanson
Carmen Horvath
Phuong Huynh
Ezzat Jaroudi
Jennifer Lancaster
Nebu Mathai
Shawn Mitchell
Valentin Peretroukhin
Dan Pettigrew
Catherine Riddell
Sylvie Spraakman
Mindy Thuna
Allison Van Beek
Geoff Wichert
Caroline Ziegler (Secretary)

1. Speaker's Welcome and Adoption of the Agenda

Council Speaker Doug Reeve welcomed members to the second Faculty Council meeting of the 2017-2018 academic year with the following remarks.

Although the Faculty's past ten years have been extraordinary, too little attention has been paid to the performance indicators in the Faculty's annual reports.

The 2017 report, for example, contains compelling statistics that address a number of the measures of our success. These include increases in the number of undergraduate, MEng and PhD degrees awarded in our Faculty, and in the number of our students taking PEY internships. The performance indicators demonstrate our growing influence throughout the world: the entering average of our undergraduate students has risen, the number of undergraduate applications has increased, and the number of graduate students has grown. Our total research funding and the number of research chairs held by faculty is up, and research citations have increased. Our Faculty is more diverse and inclusive, with the per cent of women in first year and making up our faculty almost doubling, and the number of international graduate and post-graduate students rising.

The success shown by our performance indicators can be attributed to the hundreds of faculty and staff, and thousands of students, who have made it happen. Above all, it is due to the leadership of Dean Cristina Amon, under whose tenure philanthropic donations have also increased nine-fold.

There was sustained applause for Dean Amon.

The Speaker went on to say that the agenda and meeting package were distributed on December 1, 2017. Agenda item 3, the minutes of the October 23, 2017 Council meeting, and agenda item 6, the 2017-2022 Academic Plan, were distributed on December 5, 2017.

On a motion duly moved, seconded and carried, it was resolved –

THAT the agenda be adopted.

2. Introduction of New Faculty

Grant Allen, Chair of the Department of Chemical Engineering and Applied Chemistry, introduced his new faculty members, Ariel Chan, Nikolai DeMartini and Ning Yan.

Markus Bussmann, Chair of the Department of Mechanical and Industrial Engineering, introduced his new faculty members, Xinyu Liu and Vahid Sarhangian.

The Speaker welcomed and thanked the new Council members for attending.

3. Approval of Minutes of the Previous Meeting

No errors or omissions were noted in the minutes of the previous meeting. On a regular motion, duly moved, seconded and carried, it was resolved –

THAT the minutes of the meeting of October 23, 2017 be approved.

4. Memorial Tribute to John Hay Carter

The Speaker welcomed Michael Carter, professor in the Department of Mechanical and Industrial Engineering and brother of John Hay Carter, and Geoffrey Carter, son of John Hay Carter, who were in attendance.

Farid Najm, Chair of The Edward S. Rogers Sr. Department of Electrical and Computer Engineering, read the following memorial tribute in honour of John Hay Carter.

Be it resolved –

THAT the Council of the Faculty of Applied Science and Engineering record with deep regret the death on October 9, 2017 of John Hay Carter.

John Carter received his Honours Bachelor of Science degree in Math and Physics from the University of Toronto (U of T) in 1964, and his Master of Science degree in Computer Science from U of T in 1978. Prior to joining U of T, John taught mathematics and computer science at Harbord Collegiate, Parkdale Collegiate and North Toronto Collegiate Institute. John served as the Math Department head at Parkdale and as the Math and Computer Science Department head at North Toronto. He also taught computer science at Atkinson College (York University) and overseas, spending two years teaching math in Accra, Ghana (Africa) as part of the CUSO (Canadian University Students Overseas) program.

In 1999, John began teaching at the University of Toronto, in the Department of Electrical and Computer Engineering (ECE). In 2002, John became a Lecturer in the department, specializing in teaching first-year courses such as Computer Fundamentals, Engineering Strategies and Practice, and Discrete Mathematics. In recognition of his excellent teaching, John received the 2009 Teaching Award from the Faculty of Applied Science and Engineering.

Over the span of his career, John authored numerous successful textbooks. In the 1970s, John was one of the authors of a popular series of high school math textbooks called Mathematics Alive. In 1989, John authored Problem Solving in PASCAL. While many books had already been written for the PASCAL programming language by then, those books were typically aimed at the college/university level. John's book was distinctly focused on high-school students. These textbooks were adopted widely at high schools in Ontario and other jurisdictions across Canada, including Quebec, where they were translated into French. John also wrote two textbooks for his Computer Fundamentals class: An Introduction to Computer Science Using Java (2003), and An Introduction to Computer Science Using C (2008), (Second edition, 2011).

Since 2007, John has served the ECE department as Adjudicator of Academic Offences, as the Chair's designate. For the past few years, he has also served in this role for the Faculty of Applied Science and Engineering, as the Dean's designate. In this role, John was revered for both his compassion and his fairness. "John was an amazing guy," said Professor Dionne Aleman. "I really admired how he could be simultaneously stern and caring during our academic offence meetings."

John was well-known and well-liked by all. Colleagues and students described him as funny, intelligent, warm, and insightful. "His wry sense of humour often kept me grounded," writes Jan Haugan. "I will always remember his kindness and friendship."

"He will be sorely missed by his students and all of us who had the pleasure of learning how to be better teachers from his example," said Professor Jason Bazylak.

Be it further resolved –

THAT this tribute to John Hay Carter be inscribed in the minutes of this Council meeting, and that a copy be sent to his family as an expression of the respect and gratitude of the members of this Council.

The Speaker assumed concurrence with this resolution, and Council stood to observe one minute of silence in honour of John Hay Carter.

5. Report of the Dean

Dean Amon welcomed members to Faculty Council and provided the following remarks.

(a) Faculty Leadership

The term of Micah Stickel, Vice-Dean, First Year Engineering, has been extended to 2020. Warren Chan has been appointed Director of the Institute of Biomaterials and Biomedical Engineering for a five-year term, beginning January 1, 2018. Craig Simmons was thanked for his exceptional leadership as Interim Director of IBBME while the director search was underway, while also serving as director of the Translational Biology and Engineering Program

(b) Centre for Engineering Innovation & Entrepreneurship

Construction of the Centre for Engineering Innovation & Entrepreneurship (CEIE) is nearing completion. Interior work is underway on all floors and the exterior of the building is almost finished. Occupancy will begin in April, and the official opening is planned for April 27.

(c) Other Infrastructure Upgrades

A number of other infrastructure projects are underway in our Faculty.

Six Strategic Investment Fund (SIF) research lab renovation projects have been completed, with the remaining 10 projects to be completed by April. The total value of these projects has increased

from the original \$31.5M to \$33.5M, with \$13.8M from the federal government and over \$19M invested by the Faculty and its departments and institutes.

The Dean's Infrastructure Improvement Fund (DIIF) and the Dean's Strategic Fund (DSF) are supporting a number of capital projects valued at approximately \$18M. Of this, \$8M is being used to upgrade and enhance teaching facilities, such as an extension to recent renovations of IBBME teaching labs; new fumehoods, lab benches and moveable furniture for MSE teaching labs; renovations of the lobby in the Mechanical Engineering building; new facilities and renovations at Gull Lake Survey Camp; transformation of the Engineering & Computer Science Library spaces in the Sandford Fleming building; the Wallberg Unit Operations Lab ventilation project; and the expansion of the roof of the Wallberg building to create sustainability labs.

(d) Faculty Searches

Sixteen searches are currently underway in our Faculty, including positions in computer engineering and communications, systems control and robotics and operations research, and for a new ILead director, for succession planning. We are also searching for three NSERC Industrial Research Chairs in geo-mining rock structure mechanics, plastics and vision, and health care. We are searching for a Rogers TBEP Endowed Chair, and in IBBME, a position in Medicine by Design (with funding from CFREF).

As shared at the last Faculty Council meeting, we have searches ongoing for interdisciplinary cross-appointments and diversity-related positions, which are a priority for our Faculty and the University. We are proceeding to short-list applicants for the diversity academic searches and will be meeting with the chairs and directors this week to review applications, with candidate visits and interviews to be arranged soon after.

Although we have increased our faculty complement by about 20 per cent over the last decade, we remain short in terms of teaching capacity as we continue to develop innovative programs. We currently have 16 faculty on different types of leaves, excluding research sabbaticals.

Dean Amon thanked members in advance for their support in these searches, whether acting as chairs of search committees, attending candidate seminars, participating in meetings with candidates, or joining in lunches and dinners. Together these efforts lead to successful outcomes.

(e) Academic Planning

Our 2017-2022 Academic Plan, which is the next item on today's agenda, was endorsed by the Executive Committee of Faculty Council at its November 20 meeting. After being endorsed by Faculty Council today, it will be submitted to Governing Council's Planning and Budget Committee for approval. We are developing an implementation plan to document specific actions to reach these high-level goals, the metrics by which progress will be measured, and who will be responsible for its oversight. This document will be completed by the end of February 2018.

During discussions, Dean Amon clarified that the search for the diversity positions will be supported by local committees at the department and institute level and that chairs and directors strive to ensure diverse representation on these committees. Recruiting for diversity positions is different from discipline-specific recruitment, where we post positions in journals specific to the discipline. There is flexibility and a commitment from the University regarding the creation of these positions and we need to encourage people from a wide range of backgrounds to apply.

The Dean acknowledged the efforts of those involved in summarizing the Annual Report indicators, and thanked Council members for their contributions to the progress we have made toward the goals set out in our Academic Plan.

The following items will be considered by regular motion, requiring a simple majority of members present and voting to carry.

6. 2017-2022 Academic Plan

Dean Cristina Amon presented Report 3563, the Faculty's new Academic Plan.

In 2016, the U of T Engineering community began the academic planning process by preparing our self-study. This document described how our Faculty has evolved over the last five years and identified future directions. The Faculty then underwent a three-day external review in January and February 2017, and a summary of the review team's report was shared internally and forwarded to University governance, where our position as worldwide leaders was highly praised. The review report identified several issues upon which we can improve, such as services in the Engineering Career Centre and the PEY program, and how we can more effectively engage commuting students.

The self-study and review report were used to inform the Academic Plan's framework and high-level goals, as were recommendations from the Faculty's recent task forces and working groups, annual progress reports, feedback groups, surveys and Dean's town halls. We developed five themes for the Academic Plan under the three pillars of excellence, diversity and globalization. These include fostering transformative teaching and learning; creating a vibrant student experience; enabling innovative research and entrepreneurship; promoting collaboration and partnerships; and strengthening our organization and strategic resources. We are currently creating an implementation document that defines actions toward reaching each goal, establishes targets, timelines and metrics, and identifies responsibilities for overseeing progress and annual assessments. This will be completed by end of February 2018.

The Academic Plan is a living document. We will assess and report on progress towards our goals each year, and will consider opportunities to refine the goals when appropriate or create new ones as opportunities arise.

Dean Amon thanked alumni, students, staff and faculty members of Council for their contributions to the development of the Academic Plan, and for their efforts in helping us reach our new Academic Plan goals.

At the conclusion of the presentation, the following regular motion was moved and seconded –

THAT the proposed 2017-2022 Academic Plan be endorsed in principle.

During discussions, a member asked to what extent our Academic Plan was informed by the academic plans of other institutions. Dean Amon explained that we built upon the goals of the University's plan, but did not consider the academic plans of other institutions. Our various task forces and steering committees, however, look very closely at how we compare to our peers as they develop their reports and recommendations, and we also compare metrics, such as international rankings, against these institutions.

The motion was carried. The report will be forwarded to the University's Planning and Budget Committee for approval.

7. Creation of Machine Intelligence Stream in Engineering Science

Deepa Kundur, Chair of the Division of Engineering Science, presented Report 3556 Revised, a proposal to create a Machine Intelligence stream (also known as a major or option) in the division. This item was deferred from the October 23, 2017 Faculty Council meeting to allow the division to engage students in further discussions about the stream, and to ensure that their questions have been addressed.

Professor Kundur described Engineering Science streams as emerging or rapidly-developing disciplines that offer a unique interdisciplinary academic experience and demonstrate demand and reasonable assurance of a need for graduates. Machine intelligence involves the study, development and application of algorithms that help systems learn from data. It is well-positioned within engineering's systems perspective, integration of computer hardware and software with mathematics and reasoning, and focus on problem framing and design thinking. There is much interest from stakeholders for this stream, and many opportunities for machine intelligence graduates.

Professor Kundur explained the academic rationale and need and demand for the stream, and described its admission and program requirements, learning outcomes, resource requirements and the consultation that took place as the proposal was developed.

At the conclusion of the presentation, the following regular motion was moved and seconded –

THAT the creation of a Machine Intelligence stream within the Division of Engineering Science's undergraduate program be approved, effective September 2018 as described in Report 3556 Revised.

The president of the Engineering Society discussed the results of a survey that had been conducted by the Engineering Science Discipline Club to obtain broad feedback from students on the creation of this stream.

The survey indicated that an overwhelming majority of students would like a breadth of disciplines and are in support of the Machine Intelligence stream. There was, however, inverse support for the stream according to year, and some respondents wondered if machine intelligence is a niche area that should have been first introduced as a minor. There was also concern that students may not receive enough fundamental knowledge in their first two years to adequately prepare them for their last two years in the stream. It was acknowledged that machine intelligence is present in many disciplines, such as electrical engineering, computer engineering and robotics, and that this overlap will permeate engineering well into the future. Many students felt they were not adequately consulted before the proposed stream was presented at the October 2017 Faculty Council meeting. Overall, however, the Engineering Society is pleased that the machine intelligence stream is being implemented.

During discussions, Professor Kundur said that the name of the stream was much debated by the working group, and that “machine intelligence” was chosen instead of “artificial intelligence” or “machine learning” because of its breadth and wide use.

Regarding whether the stream should have first been introduced as a minor, the division’s purpose is in part to develop majors that then follow suit as minors for other Engineering departments. The Engineering Science curriculum is intentionally dynamic and there is always risk in creating a major, but the division endeavours to do so responsibly through broad consultations. The importance of machine intelligence to Canada’s prosperity led to its development; it is not necessarily a niche-area, as some felt nanotechnology to be.

Professor Kundur confirmed that only Engineering Science students can take the stream but the division is helping to create a minor and certificate in machine intelligence, which will be open to non-Engineering Science students. Although the stream will have four new courses available only to Engineering Science students enrolled in the stream, other courses can be shared, and the growth of innovative technical electives will benefit everyone.

The motion was carried.

8. Creation of an Engineering Music Performance Minor

On behalf of the Undergraduate Curriculum Committee, Willy Wong of The Edward S. Rogers Sr. Department of Electrical and Computer Engineering presented Report 3568, a proposal to create an Engineering Music Performance Minor.

Designed for engineering undergraduates interested in exploring performance and music technology, the minor – and the Music Technology Certificate, which is coming forward under agenda item 9 – will allow students to pursue their musical interests in a way that contributes to their degree program requirements and to explore the ties between the two fields.

At the conclusion of the presentation, the following regular motion was moved and seconded –

THAT the Engineering Music Performance Minor be approved, effective September 2018, as described in Report 3568.

During discussions, Professor Wong confirmed that the minor includes a performance element, while the certificate does not. In response to a question of whether there is sufficient demand for the minor, Professor Wong responded that although this a pilot project because of the resource implications of mounting a performance, the number of students with a music background will only continue to grow. Members also discussed the challenge of locating engineering courses that will contribute to the minor and the availability of instructors to teach them.

The motion was carried.

9. Creation of a Music Technology Certificate

On behalf of the Undergraduate Curriculum Committee, Willy Wong of The Edward S. Rogers Sr. Department of Electrical and Computer Engineering presented Report 3569, a proposal to create a Music Technology Certificate.

The certificate will give students an understanding of the study of music and the applications and areas of intersection between music and engineering. The core course provides an introduction to current music-related programming applications, and students can apply this knowledge to music theory or engineering applications.

At the conclusion of the presentation, the following regular motion was moved and seconded –

THAT the Certificate in Music Technology be approved, effective September 2018, as described in the Report 3569.

There were no questions and the motion was carried.

10. Revised Undergraduate Curriculum Committee Manual

Evan Bentz, Chair of the Undergraduate Curriculum Committee, presented Report 3565 Revised, updates to the committee's manual. These include changes to the committee's membership and to language about the ongoing assessment of CEAB graduate attributes, which is fundamental to the continued accreditation of the Faculty's undergraduate programs.

At the conclusion of the presentation, the following regular motion was moved and seconded –

THAT the Manual of Procedures for the Undergraduate Curriculum Committee, as attached to Report 3565 Revised, be approved, effective immediately.

There were no questions and the motion was carried.

11. Curriculum Change for 2018-2019

Evan Bentz, Chair of the Undergraduate Curriculum Committee, presented Report 3570 Revised, proposed curriculum change affecting programs in Biomedical Engineering, Chemical Engineering and Applied Chemistry, Civil and Mineral Engineering, Electrical and Computer

Engineering, Engineering Science, Mechanical and Industrial Engineering, and the Faculty's cross-disciplinary minors and certificates.

At the conclusion of the presentation, the following regular motion was moved and seconded –

THAT the proposed curriculum changes for the 2018-2019 academic year, as described in Report 3570 Revised, be approved.

Professor Bentz confirmed that an error made in Report 3557 at the October 23, 2017 Council meeting regarding the course description and pre-requisite information about two new courses for the Machine Intelligence stream, ECE3XXH1: Matrix Algebra & Optimization, and ECE3XYH1: Probabilistic Reasoning, was corrected.

The motion was carried.

12. Reports and Recommendations of Standing Committees

The following reports were approved by the Executive Committee of Faculty Council at its November 20, 2017 meeting and are being presented for Council's information.

(a) Engineering Graduate Education Committee: Update

Julie Audet, Vice-Dean, Graduate Studies and Chair of the Engineering Graduate Education Committee, presented Report 3571 Revised, which lists new and modified courses and a new emphasis in Analytics.

There were no questions and the report was received for information.

(b) Admissions Cycle 2017

Stark Draper, Chair of the Admissions Committee, presented Report 3567, an update on the 2017 admissions cycle, including applications for admissions, offers of admission, registration figures, and characteristics of the first year class.

There were no questions and the report was received for information.

13. Admissions Committee Goals, 2017-2018

Stark Draper, Chair of the Admissions Committee, presented Report 3572, the committee's goals for 2017-2018. These include improving the quality, timeliness and diversity of offers to international students, improving the process for transfer applicants, and continuing to review the guiding principles and practices of broad-based admissions.

Professor Draper also updated Council on progress made by the committee towards its 2016-2017 goals, explaining that admissions, which had been done on a rolling basis, would now be done in three rounds to allow the committee to be more responsive in key regions.

The report was received for information.

14. Discussion Item: Summer Independent Studies Course

On behalf of the Undergraduate Curriculum Committee, Tom Coyle, Vice-Dean Undergraduate, presented an initiative to create a for-credit course that will enable research-based experiences on campus under a professor's guidance during the summer. It will be patterned after APS299Y0: Summer Research Abroad, where an independent project is conducted in an engineering laboratory at an approved partner institution abroad for 10-16 weeks in the summer term.

This course will complement other summer programs offered by the Faculty, such as the Engineering Summer Internship Program (eSIP), the fourth-year thesis course in Chemical Engineering and in Mechanical and Industrial Engineering, and opportunities for students to participate in international research projects and to volunteer or be hired to work in local research labs. Among other benefits, the summer independent studies course will allow students to align themselves with future minors, and to enhance their preparation for PEY, fourth-year thesis and graduate school.

The Speaker reminded Council that this item is for discussion purposes only and that the proposal is expected to come forward for Council's approval at a later date. In the meantime, members can direct their feedback through their curriculum committee representatives.

15. Other Business

There was no other business.

16. Date of Next Meeting

The next Faculty Council meeting is on February 27, 2018.

17. Adjournment

The meeting was adjourned at 1:43 p.m.

/cz