UNIVERSITY OF TORONTO
FACULTY OF APPLIED SCIENCE & ENGINEERING

Minutes of the Faculty Council Meeting of February 10, 2015 at 12:10 p.m. Michael E. Charles Council Chamber (GB 202)

Present:
Tony Sinclair (Speaker)
Tarek S. Abdelrahman
Grant Allen
Joe Baptista
Sharon Brown
Markus Bussmann
Anthony Chan Carusone
Margaret Cheng
Pavani Cherukupally (for Edem Dovlo)
Alan Chong
Tom Coyle
Jim Davis
Eric Diller
Khuong Doan
Jennifer Drake
Uwe Erb
Mohammadreza Fazeli
Andrew Fisher
Genevieve Foley
Ryan Gomes
Krisztina Harmath
John Harrison
R. Douglas Hooton
Sean V. Hum
M. Reza Iravani
Jia Jia
Gina John
Michael Kim
Penny Kinnear
Raymond Kwong
Elias Kyriacou
Qian Li
David Lie
Antonio Liscidini
Manfredi Maggiore
Brenda McCabe (Acting Dean)
Farid Najm
Tom Nault
Teresa Nguyen
Graeme Norval
Jeffrey A. Packer
Vladimiros G. Papangelakis
Lacra Pavel
Nelly Pietropaolo
Katie Sampson
Ted Sargent
Amer S. Shalaby
Craig A. Simmons
Brent Sleep
Micah Stickel
Pierre Sullivan
Deborah Tihanyi
Piero Triverio
Shahrohk Valaee
Sorin P. Voinigescu
Peter Weiss
Lydia Wilkinson
Tony Zhang
Jean Zu

Regrets:
Edem Dovlo
Bryan Karney
Dawn Kilkenny
Camila Londono
Jun Nogami
Christopher Yip
David Zingg

Guests:
Michelle Beaton
Alina Constantin
Christina da Rocha-Feeley
Michelle Deeton
Leslie Grife
Jan Haugan
Estelle Oliva-Fisher
Catherine Riddell
Caroline Ziegler

1. Welcome and Adoption of Agenda

Council Speaker Tony Sinclair thanked members joining the third Faculty Council meeting of the 2014-2015 academic year and welcomed all present. He noted that the agenda and documents were distributed on January 27.

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

> THAT the agenda be adopted.

2. Introduction of New Faculty Member

Jean Zu, Chair of the Department of Mechanical & Industrial Engineering, introduced her new faculty member, Michael Jong Kim.

3. Adoption of Minutes of Previous Meeting

No errors or omissions were noted on 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 November 25, 2014 be approved.

4. Memorial Tribute

Farid Najm, Chair of The Edward S. Rogers Sr. Department of Electrical & Computer Engineering, read the following memorial tribute in honour of Anastasios (Tas) Venetsanopoulos, Dean Emeritus of the Faculty and Professor Emeritus of the ECE department.

Be it resolved –

> THAT the Council of the Faculty of Applied Science & Engineering record with deep regret the death on November 17, 2014 of Anastasios Venetsanopoulos.

Dean Emeritus Anastasios Venetsanopoulos, better known as Tas, was a pillar of UofT Engineering, known for his pioneering research and strong leadership. He was a mentor and friend for many colleagues, and a guiding light for generations of students.

Tas received the Bachelor of Electrical and Mechanical Engineering degree from the National Technical University of Athens in 1965, and the Master of Applied Science, Master of Philosophy and Doctor of Philosophy in Electrical Engineering from Yale University in 1966, 1968 and 1969 respectively. He joined the Department of Electrical Engineering at the University of Toronto in September 1968 as a lecturer and was promoted to assistant, then associate professor with tenure in July 1974. He was promoted to full professor in July 1981.

Tas was an internationally renowned researcher in the fields of multimedia systems, digital signal and image processing, digital communications and biometrics. He made significant advances to our understanding of multidimensional filter theory and design, and has opened up new fields of inquiry in telecommunications, design of non-linear filters, multimedia neural networks and biometric techniques. He is regarded as a leading authority in the field of image processing, and introduced a number of techniques for colour image enhancement, filtering and analysis. Throughout his career he demonstrated an exceptional intuition for bridging laboratory research into broader engineering applications.

He wrote nine books and more than 850 papers, which have been cited more than 14,000 times, by recent Google Scholar count. Among a long list of professional accolades, he was named a Fellow of the Royal Society of Canada, the Institute of Electrical and Electronic Engineers, the Canadian Academy of Engineering, and the Engineering Institute of Canada, as well as a member of the New York Academy of Science. Tas was awarded the IEEE's prestigious Millennium Medal and McNaughton Award. He was a Fulbright Scholar and a Schmitt Scholar, and in 1994 was awarded an Honorary Doctorate from his alma mater, the National Technical University of Athens.

Tas's leadership in research was more than matched by his leadership of his students and peers. He served as president of the Canadian Society of Electrical Engineering from 1983-1986. From 1997-2001 he was associate chair, graduate studies, in the Department of Electrical & Computer Engineering, and served as its acting chair from January to June 1999. That same year Tas became the inaugural Bell Canada Chair on Multimedia.

From 2001 to 2006, Tas led the Faculty of Applied Science & Engineering as its 12th dean. During his term, UofT Engineering was involved in a major fundraising campaign and the construction of two buildings, The Bahen Centre for Information Technology and the Terrence Donnelly Centre for Cellular and Biomolecular Research. In 2006 Tas retired to become a professor emeritus.

That year he joined Ryerson University as the school's founding vice-president of research and innovation, a portfolio that included oversight of the university's international activities, research ethics, Office of Research Services and Office of Innovation and Commercialization. He retired from that position in 2010 but remained a distinguished advisor to the role. Tas continued to actively supervise his research group at the University of Toronto, and was a highly sought-after consultant throughout his career.

Tas was respected by colleagues the world over, but nowhere more so than here in Toronto. With an ever-present smile, he motivated and inspired generations of young engineers to follow his example and become leaders themselves. His peers remember him as an enormously accomplished scholar as well as a wonderful and kind person. He is deeply missed by students, staff and faculty alike.

Be it further resolved –

> THAT a record of his service be inscribed in the minutes of this Council, and that a copy be sent to his family as an expression of the respect and gratitude of the members of Council.

The Speaker assumed concurrence with these resolutions, and Council stood to observe one minute of silence in honour of Professor Emeritus Venetsanopoulos.

5. Report of the Acting Dean

Acting Dean Brenda McCabe welcomed members to Faculty Council and provided the following remarks.

(a) CEIE Update

We are making progress on our new Centre for Engineering Innovation & Entrepreneurship (CEIE). Underground Bell lines have been rerouted construction hoarding is in place, and heavy equipment is coming in this week to begin dismantling and demolishing the TYP Building and the back half of the Physical Geography Building. This work will be completed by May 1st, and the rezoning application should go before City Council at their March meeting. In the meantime, we will go out to tender in March so that we will be ready to start building in May, should rezoning be approved.

(b) Undergraduate Applications

Our Faculty has had another record-setting year for undergraduate applications, receiving 11,562 for 1,130 undergraduate spots, up slightly from last year. The deadline has been extended to February 16, by when we expect to receive another 500-1,000 applications.

(c) Dean's Strategic Fund

The call for proposals for the next round of the Dean's Strategic Fund has been issued. Notices of intent are due to the Dean's Office by February 17 and require your Chair's full support. Details are posted on the Faculty's website.

(d) Town Hall

The Dean's Office held a student town hall in late January, in partnership with EngSoc. It was very well attended and generated much discussion on a number of topics, including course evaluations and academic advising. We are currently reviewing the meeting notes, along with additional questions that were submitted in writing, in order to determine how to best address them.

(e) Celebrating Engineering Excellence

Our Celebrating Engineering Excellence awards reception for faculty and staff is scheduled for Tuesday, April 21st from 4:00-6:00 p.m. in GB202. This is a wonderful opportunity to recognize and celebrate our colleagues and their contributions to the Faculty.

(f) Women in Engineering Campaign

The Faculty recently launched a targeted campaign to highlight our successes in recruiting women to our engineering programs: 30.6% of this year's first year class is female. This is a record for our Faculty and represents the highest percentage in the province. Since the launch, we have been featured in several publications including Metro Toronto and FLARE magazine, and expect stories in the National Post and The Globe & Mail in the near future. The article on our website has received over 6,000 views and reached over 400,000 people through social media. We look forward to continuing this campaign over the coming months.

Several of our female-centric outreach and recruitment activities, such as Girls' Jr. DEEP Saturdays, the Girls' Leadership in Engineering Experience (GLEE) Weekend, and Go ENG Girl, continue to impact how young women view engineering and a potential future at U of T. In addition, three out of four of our most recent faculty hires are women, and all three of our recent CRCs are outstanding women faculty.

Acting Dean McCabe closed by reminding members that Dean Cristina Amon will be returning from her leave on April 1st.

6. Online Term Work Petition Process

Pierre Sullivan of the Examinations Committee presented Report 3448 Revised, a proposal to streamline and centralize the online term work petition process across our undergraduate programs. This report was first presented for Council's information at its November 25, 2014 meeting, where concerns were expressed that the proposal would make instructors passive recipients of information and limit their involvement with the process. Members subsequently approved a motion that "Report 3448: New Online Term Work Petition Process not be accepted for information, but be brought as a major report before Faculty Council at its February 10, 2015 meeting".

Professor Sullivan reviewed the proposal, reminding members that under the current paper-based system, students submit their term work petition forms directly to their instructors and the instructors determine if and what accommodation is in order. In the proposed system, students will submit their petitions via the Engineering Portal to their program's academic advisors, who will ensure that the petitions meet the policy and best practice requirements, and include the required documentation. Valid petitions will then be forwarded to the instructor to determine the appropriate accommodation. These changes will allow academic advisors to discover and intervene much earlier when students experience difficulties, allow for more consistency across programs, and be less burdensome on faculty.

Since the November Council meeting, the Examinations Committee discussed the role of faculty in the term work petitions process with the concerned Council member. Although the Committee stands by its original recommendation to limit involvement of faculty so that the term work petition process can be consistent and simple to follow, it revised the report to state that instructors or core coordinators will not "normally" [word added] be involved in determining if the petition is valid. Professor Sullivan added that any feedback provided by a professor on the validity of a petition would potentially be protected under

the Freedom of Information and Protection of Privacy Act (FIPPA). Professor Sullivan then reviewed the proposed work flow involving petitioning students, counsellors, and professors.

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

> THAT the new online term work petition process described in Report 3448 Revised be adopted and implemented starting with the summer 2015 Engineering courses.

During discussions, Professor Sullivan confirmed that "counsellors" are the undergraduate counsellors in each department, and that the new process will be communicated to the undergraduate student body via email and through departmental announcements.

The motion carried.

7. Dean's Task Force to Review the Core Curriculum: Final Report

Micah Stickel, Chair of the Task Force, presented the Final Report of the Core Curriculum Task Force for discussion, thanking the task force members, and students, faculty and staff for providing input. He reviewed the task force's terms of reference and the sources consulted for the review, namely students and faculty, the external engineering education literature, and the best practices of other top engineering schools in Canada and the US.

Dr. Stickel provided an overview of the current curriculum in the Core 8 and Track One programs, describing its many positive aspects, including its strength and breadth of foundational material; interesting and challenging courses; focus on engineering design, communications, and teamwork; engaged faculty; and a talented and hard-working group of students.

The major findings of the report pertain to student workload, the advantages and disadvantages of the common first year and transferability; the evolving needs of the engineering profession; and the need for innovation in the first year curriculum. Specific recommendations for improvement are listed in the report, which is posted on the Faculty's website.

Dr. Stickel then outlined two proposed curriculum models: the first is based on a common first year while the second offers program-specific courses in the winter term. He concluded by reviewing the task force's short-, mid-, and long-range plans, the first of which is to establish an implementation working group with broad representation from all departments and programs, to consider in greater detail and implement the task force's recommendations.

A member urged the task force to consider the proposed curriculum models carefully and asked if the implementation working group would be open to other models, taking into account further input from departments. As an example, he mentioned the proposed decrease of chemical engineering content in the first model, saying that it is important for this content

to be stable or to increase. Dr. Stickel answered that the first model provides a strong, broad foundation to our students, offering a program-specific first-year experience while allowing the TrackOne program and possible program-to-program transfers for qualified students. He reminded members that the models have been suggested for further consideration only, and reiterated that all proposed curriculum changes must be approved by the Faculty's Undergraduate Curriculum Committee and by Faculty Council.

A student member questioned how the models will address the balance between workload and the ability of students to retain the information learned. Acknowledging that the Faculty should do a better job at holistically delivering and assessing what is being taught, Dr. Stickel responded that the models include 1.5 additional hours that can be used for the delivery and review of content.

In response to a question, Dr. Stickel clarified that the implementation working group will morph into the first-year Core 8 curriculum committee, which will consist of the Chair of First year and departmental chairs. This committee will serve to close a gap in curriculum planning since departmental curriculum committees typically focus on curriculum matters in second year and up. Dr. Stickel agreed that it would be beneficial for each program to have a first-year curriculum specialist, as is the case in Engineering Science, and said that while not all programs have such a dedicated person, most have faculty in place whose portfolio includes first-year curriculum planning.

Stating that engineering is one of the last four-year professional programs, a member asked if the task force had considered moving to a five-year model. Dr. Stickel said that there does not appear to be wide-spread interest in this at other institutions, and that we might focus instead on increasing our quality of instruction instead of quantity. When the member pointed that the proposed models show an increase in the number of contact hours, Dr. Stickel said that the key is to use these hours wisely, for example, to teach students to be agile learners who can master rapidly-evolving technology.

A member stated that the first model includes adequate lecture time for physics, but only one hour for labs, which may be insufficient for some upper-year students. Dr. Stickel thanked him for his comment and reiterated that the two models are only starting points for discussion.

8. Major Curriculum Changes, 2015-2016

Graeme Norval, Chair of the Undergraduate Curriculum Committee, presented Report 3457, which lists proposed curriculum changes for the upcoming academic year, including a reduction of lecture contact hours in *APS112H1S: Engineering Strategies and Practice II*; the removal of *APS150: Ethics in Engineering* from the first year Core 8 and Track One curricula; the creation of a fall term seminar course, *Orientation to Engineering*; the addition of a one-hour per week laboratory component to *MAT188H1F: Linear Algebra*; and the introduction of an online course, *Introductory Chemistry from a Materials Perspective*.

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

> THAT the proposed major curriculum changes to the first year Core 8 and Track One programs for the 2015-2016 academic year be approved.

Dr. Norval confirmed that all content in *APS150: Ethics in Engineering* will be removed from the first year curricula, and each department will deliver an engaging and relevant presentation of ethics in the third and fourth year of their programs. In addition, ethics in an academic setting will be incorporated into the proposed *Orientation to Engineering* seminar course, and in ESP I and II.

The new online-only course *Introductory Chemistry from a Materials Perspective* will be delivered to students both external and internal to our program. The course, or components of it, can be integrated into existing or future Core 8 and Track One first-year programs.

The motion carried.

9. Reports and Recommendations of Standing Committees

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

(a) Engineering Graduate Education Information Report

Markus Bussmann, Chair of the Engineering Graduate Education Committee, presented Report 3456 which includes the approval of *MIE1224: Heating, Ventilation and Air-Conditioning (HVAC)*, and *ECE1477H: Optical Interconnects*. The report also describes a change to *APS1030H,* from *Navigating Careers in a VUCA World (Volatile, Uncertain, Complex, Ambiguous),* to *Engineering Careers – Theories & Strategies to Manage your Career for the Future.*

The item was received for information.

(b) Emphasis in Sustainable Energy

Markus Bussmann, Chair of the Engineering Graduate Education Committee, presented Report 3455, a proposal created by the committee and the Institute for Sustainable Energy to establish an emphasis in sustainable energy. This will be of interest to students pursuing an MEng, MASc or PhD in our Aerospace, Chemical Engineering & Applied Chemistry, Civil Engineering, Electrical & Computer Engineering, Materials Science & Engineering, and Mechanical & Industrial Engineering programs, allowing them to develop an understanding of the limitations, challenges and opportunities that face contemporary energy systems. Although the achievement of an emphasis is not reflected on a student's transcript, the student will receive a letter of completion.

The item was received for information.

10. Broad-Based Admissions Update

Micah Stickel, Chair of First Year, presented an update on the Plan for Personal Profile Pilot Program, initiated three years ago to consider broader metrics for admitting students than simple academic performance.

The pilot project was launched when an increase in the number of applicants (57% since 2008 and mostly international) caused the Faculty to consider if the metrics used to assess applicants from diverse backgrounds were sufficient and accurate. Other motivating factors were increasing entrance averages (from 88.9% in 2008 to 92.4% in 2014), making it more difficult to achieve equitable admissions decisions, and the predictive validity of current metrics of "success".

The goal of broad-based admissions is to enhance our assessment of students' ability to clearly articulate their thoughts and ideas in both oral and written forms and to develop a logical argument relating to the critique of a technical scenario. It will also allow us to better assess the key non-cognitive characteristics that would enable applicants to be successful within our program.

The new admissions component of the personal profile includes three questions (two presented in video form requiring video responses, and one presented in written form requiring a written response), drawn at random from a bank of questions. For each question, applicants have a fixed amount of time to prepare and a fixed time to record or write their response. The process should take no longer than 20-30 minutes per applicant, including initial media set-up and practice interviews. In 2014-2015, only the oral and written communication components of the scoring will be incorporated into the admissions decisions.

The video profile assessment process includes faculty conducting an initial review of possible candidates for admission to ensure a profile assessment is necessary, then two alumni assessors reviewing and scoring the interview. A third assessment will occur if the scores of the first two assessors differ significantly. The potential risk of implicit bias in the assessment process, particularly related to race and gender, will be mitigated by the use of guidelines and training sessions.

Skills the alumni assessors bring to the process include experience gained through professional practice in hiring and interviewing, engineering analysis, critiquing oral and written communication, and understanding the attributes needed for success in the engineering profession.

The process and questions will be refined for next year's admissions cycle, and it is expected that at least three cycles will require completion before any concreate decisions can be made regarding the usefulness of the broad-based admissions process. A research study for this project is in development with OISE.

Dr. Stickel stated that using alumni assessors with interviewing and hiring experience allows the Faculty to draw upon a large pool of expertise without having to require active faculty to take this on or to hire additional resources. It also enables us to engage our alumni in a meaningful way.

An alumni member asked if the Faculty takes into consideration the reputation of applicants' high schools, since marks aren't the only indicator of success. Dr. Stickel said that ten years ago, we would have considered historical data concerning high schools, but after the double graduating cohort, the validity of this approach was disputed and it was removed. The challenge relates to fairness, as teachers and principals can change over the years, affecting a school's reputation. In addition, because data was available from only some schools, the findings could only be applied to a small sub-set. The Registrar added that the lack of inter-year reliability makes it difficult to build a valid statistical model.

11. Other Business

There was no other business.

12. Date of Next Meeting

The next Faculty Council meeting is on April 17, 2015.

13. Adjournment

The meeting was adjourned at 1:34 p.m.

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