



UNIVERSITY OF TORONTO
FACULTY OF APPLIED SCIENCE & ENGINEERING

Minutes of the Faculty Council Meeting

Wednesday, November 25, 2009

12:10 – 1:40 p.m.

Michael E. Charles Council Chamber, Galbraith Building

Present:

Yu-Ling Cheng (Speaker)
Vanessa Abaya
J. Stewart Aitchison
Anthony Alayo
D. Grant Allen
Cristina Amon (Dean)
Phil Anderson
Erika Bailey
Sebastien Balda
Ridha Ben Mrad
Evan Bentz
Estina Boddie
Sharon Brown
Phil Byer
Tim Chan
Michael E. Charles
David Cheung
Will Cluett
Tom W. Coyle
Marwan Dajani
Chris Damaren
Khong Doan
Catherine Gagne
Becky Gan
Ike Goodfellow
John Hadjigeorgiou
Greg Jamieson
Gina John
Bryan Karney
Mark T. Kortschot
Eva Kuhn
Song-Lian Lai
Yuri Lawryshyn
Ofer Levi
Jimmy Lu

Saminur Majumder
Mike Marr
Susan McCahan
Barbara McCann
Brandon McLean
Liam Mitchell
Graham Morse
Farid N. Najm
Ken Ng
Jun Nogami
Graeme Norval
Austra Ozolins
Ampy Pural
Doug W. Reeve
Lisa Romkey
Paul Santerre
Angela Tran
S.A. Sheikh
Pierre L. Sullivan
Peter Weiss
Lorna Wong
David W. Zingg
Jean W. Zu

Guests:

Estina Boddie
Kate Brand
Carolyn Farrell
Adam Fox
Norman Goh
Jen Hsu
Ian Marquez
Tom Nault
Geoff Wichert

Regrets:

William Bawden
P.C. Birkemoe
Kelly Bryck
Ramin Farnood
Jacquelyn Maccoon

C.A. Mims
Diana Mollicone Maria Sebastian
K.A. Selby
Chris Yip

1. Welcome/Adoption of the Agenda

The Speaker, Professor Yu-Ling Cheng, noted the excellent attendance, thanked members joining the meeting and welcomed all present for the first Faculty Council meeting of the 2009-2010 academic session.

On a motion duly moved and seconded

THAT the agenda be adopted.

The Speaker took this opportunity to remind members of the procedure for speaking. Members may speak when recognized by the Speaker. She asked that they please stand, address the Speaker and introduce themselves.

2. Report of the Dean

Dean Cristina Amon welcomed members to Faculty Council. She indicated that this was the season of rankings. Two in particular were recently issued: the Times Higher Education University Rankings and the Shanghai Jiao Tong Academic Ranking of World Universities.

2.a) Rankings

She said that the Times Higher Education rankings were based on the reputation of peers and other academic institutions, as well as the corporate and industrial world. In this ranking the Faculty of Applied Science and Engineering remained first in Canada for the third year in a row and was ranked two spots higher at 8th in the world, as well as now 5th in North America with MIT, Berkeley, CalTech and Stanford universities in the US. These rankings are based on visibility and also show how well our students and our alumni represent the Faculty. Dean Amon congratulated everyone for their part in this result.

Dean Amon indicated that the Shanghai Jiao Tong Academic Ranking of World Universities was based on the research component and used four quantitative indicators on the performance of researchers. She explained that equal weight was distributed between each indicator: highly cited research (HiCi); published articles in the field (PUB), which is impacted by the size of the university; percentage of articles published in the top 20% of journals in the field (TOP); and Engineering research expenditure (FUND), which was also impacted by the size of the university. The research

2. Report of the Dean (continued)

2.a) Rankings (continued)

expenditure (FUND) in Canadian universities is accounted and reported differently than U.S. counterparts, which accounts for lower scores. If it were reported differently, the Faculty would appear in the top 10% of the overall standings. As such, the Faculty had done well in the October rankings and was up two spots from 21st to 19th in the world. She reiterated her congratulations, in particular to the professors and researchers whose hard work had garnered these results.

Two other rankings were issued, the Maclean's and the Globe and Mail Report Cards. The rankings were based on the responses by a random collection of students and were attributed to the University as a whole, versus for the Faculty of Applied Science and Engineering. She indicated that the Faculty would most likely have fared better, as compared to the University of Toronto based on the NSSE results and because of the unique learning community; she recognized that the Faculty as a whole needs to continue to strive to do more work in student satisfaction, engagement and perception.

The importance in rankings, as well as these metrics and surveys, is that not only does this boost morale, but it also helps the Faculty recruit the best and the brightest students and faculty, especially in the international arena. Dean Amon also noted that while no one survey represents our full range of strengths, these increased standings are a testament to the strength in our programs, research and innovative work at the Faculty.

2.b) Annual Report

Dean Amon was pleased to announce that the inaugural Annual Report was in production and that in the recent newsletter the Report's chapters had been available to members. This Report would publish quantitative data and metrics from 2008-2009 and compare the data with peer institutions as well as the Faculty's historical data dating back to 2000.

This snapshot of performance parameters will help in the assessment and critical review of how the Faculty of Applied Science and Engineering had performed in its academic priorities and goals. The Dean invited members to provide input to this comprehensive and consultative report.

2.c) Faculty of Applied Science and Engineering Self-Study, External Review and Academic Planning

Dean Amon reported that the Faculty's Self-Study Working Group had begun meeting in September to assess where we are, to critically reflect on the accomplishments and to look into the near future goals.

This Self-Study would then be provided to the External Reviewers, a process that will be commissioned by the Provost, likely in the spring of 2010.

The broader consultation of the Self-Study had already begun with leaders within the Faculty, with groups and it would be expected that increased consultation would happen over the course of the next few months.

2. Report of the Dean (continued)

2.c) Faculty of Applied Science and Engineering Self-Study, External Review and Academic Planning (continued)

In parallel to this was the Academic Planning process. The *Stepping Up* Academic Plan would be concluding in June 2010. Within the framework of the University of Toronto's *Towards 2030* initiative, the Faculty was developing its own framework to prepare the Academic Plan for the next five to seven years.

2.d) Academic Programs: Minors

Dean Amon reported that the new Minors in Environmental Engineering and in Sustainable Energy had been very well received. She indicated that over 500 students had been registered in one of the three Minors available to undergraduate students. The Faculty was looking into developing two new Minors: Engineering Business and Globalization. Input would be gathered from the stakeholders in preparation for these new Minors.

To oversee the cross-Faculty activities, the Cross-Disciplinary Office had been established in May 2009. In September 2009 Professor Bryan Karney was appointed the first Associate Dean, Cross-Disciplinary Programs.

2.e) Acting Chair, First Year

Dean Amon announced that Professor Mark Kortschot had been appointed Acting Chair, First Year from January to June, 2010. During this time Professor Susan McCahan would be on sabbatical. She thanked Professor Kortschot for his support in this.

2.f) Finances

As was the case in other divisions throughout the University of Toronto, and in other institutions across the world, the Faculty had been negatively impacted by the current market. The zero pay-out on endowment also had a negative impact. In response to this climate, the Faculty had streamlined its activities. We also took in more First Year students this year and anticipate reducing the size of the first year class in the next year. As a result, we are in a good situation, especially when compared to other divisions and universities.

Dean Amon thanked those who have contributed to this positive response.

2.g) Retention Rates

There was an increase in retention rates recently due to a number of reasons: academically stronger students, a more selective admissions process and an increase in support programs available to undergraduate students. Programs such as the mentoring partnerships, coaching and Success 101 that provided students with study and life skills, all made positive contributions to our students' improved academic results.

The Dean's report was received for information.

3. Approval of the Minutes of the Previous Meeting

On a motion duly moved and seconded

It was resolved

THAT the minutes of the meeting of May 27, 2009 be approved as circulated.

4. Proposal for Engineering Science Major in Engineering Mathematics and Finance

Professor Will Cluett presented the proposal for the creation of an Engineering Science Major in Engineering Mathematics and Finance, in Report 3237 of the Curriculum Committee circulated with the Agenda in advance of the meeting.

He indicated that two years ago when the Manufacturing Major (Option)¹ was closed, he committed to work with the Department of Mechanical and Industrial Engineering, and specifically with Industrial Engineering, to bring forward a new Engineering Science Major. This new Major would be housed in that same Department.

Professor Cluett noted that this program was in response to an increased demand for Engineering Finance and that a number of prominent alumni were already involved in this field. Toronto also provides a unique environment as a national financial centre. The course of study would be analytical, quantitative and rigorous. It would also be the first such program in Canada and remarked that a few similar programs exist in prominent US universities.

On a motion duly moved and seconded

THAT a Bachelor of Applied Science in Engineering Science - Major in Engineering Mathematics and Finance be approved in principle, subject to minor changes as outlined in the attached proposal, effective September 2010, subject to university governance approval.

Speaker Cheng invited discussion from members of Council.

A member noted that he was against this motion and believed that this was the wrong direction for the Faculty because the basic fundamental and immovable principles of engineering were not applicable in the financial field. He remarked that the recent downturn in the global economies and the financial problems were not immutable. While graduates from such a program would learn a series of tools, they would not be testable in a concrete way and were, rather, applicable to non-physical fields.

¹ The terms Major and Option were used interchangeably during this discussion. The official degree is a Major. The common usage for these programs in Engineering Science is 'Option'.

4. Proposal for Engineering Science Major in Engineering Mathematics and Finance (continued)

A member responded that the trends in Industrial Engineering were moving away from the physical aspects of engineering and were evolving into a number of diverse research areas. More broadly, Industrial Engineering was moving towards the financial, healthcare, and retail industries.

These areas were distinctly non-physical. In addition, she remarked that many alumni from the Department were working in finance. These alumni indicated that the training in this field attribute their skills to their education in engineering. She concluded that there was strong alumni support for this Option.

A member responded that the examples were good, however that they were not empirically derivable to study if they don't work. The member expressed strong concerns that the students would be taught to engineer the economy which, he suggested, could not be engineered.

A member noted that in the Department of Mechanical and Industrial Engineering, finance is a tool, not a discipline.

Another member supported the motion because he noted that students would learn a range of tools in the sophisticated mathematical equations that would be learned as engineers, but that could then be applied to the world of finance. By using the application of engineering questions to the real-world financial problems, students would learn to use their skills in both the engineering and finance worlds.

He also noted that as engineers, we were bound by a code of ethics that, when applied to the financial sector, would strengthen the sector.

A member remarked that this Major had begun development before the financial crisis and was, therefore, not in response to the current market situation. He also noted that the sophisticated equations learned in the Major would be well applied to the financial field.

Another member spoke in support of the motion and said that Industrial Engineering often deals with scheduling and logistics. The students in this Major would learn mathematical skills in finance and that they would need a very strong math background. He regarded engineering as being too necessarily tied to physical applications when the field was developing more broadly.

The next member also supported the motion and noted the establishment of BizSkule™ as one example of the developing interest in the field of study. This would be an engineering education valued by business professionals and would increase the overall successes of our graduates. It would apply fundamental and processing engineering. He also mentioned that for students outside of the Engineering Science program and who would have an interest in business, there was a working group looking at the establishment of a Minor in Business Engineering, that this would be available to all students.

4. Proposal for Engineering Science Major in Engineering Mathematics and Finance (continued)

A member who had previously been concerned about this proposal was now in favour of it because Princeton, Stanford and Columbia universities all had similar and successful programs.

One member asked about what successes the US engineering schools' programs had and second, with the engineering principles being applied, would this not be an option that Commerce students would wish to take?

A member responded that the reaction in the US schools was that this was a growing phenomenon and that there had been very strong participation. The learning had been vibrant and there was increasing demand. He added that in each case, there was at least one prominent mathematician researcher that increased the engaged nature of learning and increased the profile of the program. This also attracted other scholars to the programs.

The member also said that this was a legitimate engineering option, citing an increase in IEEE journals in systems. He noted that in the European Union the resources had been deregulated and therefore needed powerful engineering mathematics and principles to moderate the financial instability in resource prices to the end users. He concluded that this was a trend that the world was moving towards and this Option was in timely response.

Another member remarked that this does apply to the physical aspects of engineering in that when engineers needed to know about the life-cycle cost of a building or resource, they were having difficulty calculating this and would bring in a business school scholar to assist. This was an urgent need in environmental engineering, sustainability and in durability.

The member alerted Council to the language associated with Financial Engineering as it did not reflect the course of study.

A member added his support for the motion and indicated that it was right for the University of Toronto because of the advantages in the local community and industry just outside of the University's walls. He also said that the Working Group for the Business Minor would have to hear from the Commerce program as to whether there would be interested in offering this Minor to their students.

Another member had a question about the 2+2 model of Engineering Science studies that the Years 1 and 2 were combined and that Years 3 and 4 were for the Options. He wished to know if this was going to benefit the 80% of Year 1 and 2 students and how would this impact their curriculum as a result of this Option's introduction?

A member responded that many students had already indicated that they would like an Option that had a stronger, more rigorous mathematical study. Therefore, this Option would build on the mathematics and statistics in Years 1 and 2. He also added comments from Professor Alan White (Rotman School of Management) and Glynn Williams

4. Proposal for Engineering Science Major in Engineering Mathematics and Finance (continued)

(Engineering Science alumnus), the two outside members of the Working Group as follows:

Professor White's statement indicated that the students in the program would learn analytical math skills that will help them with their future careers, some of which could be in the financial sector. Mr. Williams' discussion points included the need to not only design engineering projects, but to also put together the financing and project management that would realize the innovation.

In response to the question on the Years 1 and 2 in Engineering Science, a member responded that there would be an increase in the treatment of mathematics and statistics, for example in partial differential equations, which would be applicable throughout all studies.

He noted that students were well-positioned to take on mathematics-intensive programs of study and that in Years 1 and 2, they established the mathematical footholds that would support them through Years 3 and 4 of study.

A member indicated that engineering does need to explore new directions, and that this Major does that. He asked about the reaction from Rotman School of Management, outside of the one member who had sat on the Working Group. He also asked about how the Canadian Engineering Accreditation (CEAB), which is a conservative organization, might react to this new Major.

A member responded that the rigorous mathematical field would not suit everybody; even some students in Engineering Science, however this would take advantage of the strong math and statistics in other programs to provide breadth and depth in math preparation.

In terms of the reaction from the Rotman School of Management, they had met during the early stages of the Option development, as well as throughout. They had indicated strong support of this program of study and that there were only two courses offered as electives in the fourth year, so there would be modest involvement.

The Department of Statistics would have increased contributions to the Option. Regarding possible changes to Years 1 and 2, the Division of Engineering Science would revisit the statistics courses provided. After the Manufacturing Option closure, and the introduction of the Engineering Mathematics and Finance Option, the foundations for the statistics course would be reconsidered.

In response to the question about CEAB, this would be an opportunity to lead discussions with Engineers Canada, to approach them, and to work with them in a proactive way to ensure that the Major is accreditable. A capstone course was added that would work with partners in industry.

Another member asked for clarification between Financial Engineering and Engineering Finance.

In response, a member indicated that Financial Engineering now had a bad name, due to the current state of the markets and implied that the financial laws were being changed. Instead, the Engineering Mathematics and Finance showed the focus on stringent mathematical studies with an end result in the application in the financial sector.

A member indicated that his previous concerns had been mitigated by the previous discussion, however wished to caution faculty and staff that this would not produce answers that were right, and that the market will always be unstable.

A member added that a few of the points against heard today were because of the recent financial crisis, however he said that because of this crisis, it was more important than ever to infuse finance with mathematic and statistic – stringent studies. That the current state of the global economy had more to do with oversight, governance and ethics, rather than with financial errors.

The speaker called the question. The motion was duly passed.

5. Changes to the Curriculum

5.a) Curriculum Updates for the 2010/2011 Faculty Calendar

Professor Jamieson summarized the proposed changes to the curriculum in Report 3236 of the Curriculum Committee. The three major changes included:

- a new ethics in engineering zero-credit course that would build upon the engineering ethics in APS111 and APS112 courses;
- the recognition on students' transcripts for their work in the Refresh course, designed to help first year students build on their skills so they can return the following fall; and
- a revision in the Industrial Engineering program in response to the CEAB visits that provide more consistency.

Dean Amon noted that there was an error in the Report, that CME185 had been included in error. She moved to amend the report and it was duly seconded.

A member noted that MSE290S and MSE390F were incorrect and should read:

- MSE290S Communications I: Format change: -/-/2 -> -/1/1
- MSE390F Communications II: Format change: -/-/2 -> -/1/1

It was moved to further amend the motion to include the corrections to the two MSE courses. It was duly seconded

THAT the curriculum changes, with revisions to CME185, MSE209 and MSE390 in Report 3236, for 2010/2011 Faculty Calendar be approved.

5. Changes to the Curriculum (continued)

5.a) Curriculum Updates for the 2010/2011 Faculty Calendar (continued)

A member asked about including the Refresh course and what success it has had thus far.

Another member responded that this was the pilot year for 16 students who, under the previous rules, would not be allowed to continue. These students would have received an average < 50% in their 1F term. It was expected that this year's enrolment would increase, but numbers would not be known until final exams had been marked.

A member added that of the 16 enrolled in the Refresh course, 12 had returned and we would know in January, the success rate of those returning.

A different member commented that there was value to the ethics course however was concerned that by including this on the transcript that would ascribe weight to the course. The member also indicated that in the ethics course, he was concerned that students would perceive that there was no value to ethics.

A member responded saying that ethics is still included in the APS111 and APS112 courses and that this would build on that strength and serve to reinforce the importance.

Another member expressed concern that the ethics course would add work to an already heavy workload for students. While the materials would be provided, there was no class time and would, therefore, not constitute a solid course.

In response, a member said that there was a tutorial associated with the ethics course. She also said that this course ties the professional engineering ethics to the academic ethics required in the university setting. She noted that the number of academic misconducts had increased, predominantly based on lack of knowledge around ethics. She said this course would provide the foundational thinking as professionals and academics. In addition to the materials and tutorials, there were on-line case studies to work on and the exams could be taken when students chose. This exam would parallel the PEO exam.

She also indicated that part of the pass/fail grading on the ethics course was based on attendance, participation, as well as basic skills, quizzes and tests.

A member recommended that a marking scheme be developed to increase the percentage of required topics in ethics.

The Speaker called the question.

The amended motion carried.

5. Changes to the Curriculum (continued)

5.b) Proposed Session Dates for 2010/2011

Professor Greg Jamieson proposed the following sessional dates for 2010-2011:

	APSC
First Day of fall classes	Thursday Sept 9
Thanksgiving	Monday Oct 11
Last day of Q1 courses	Friday Oct 22
First day of Q2 courses	Monday Oct 25
Q1 final exams	Oct 25-29
Last day of fall classes	Wednesday Dec 8
Exam Study Period	Thursday Dec 9
Fall Exams Start**	Friday Dec 10
Fall Exams End	Tuesday Dec 21
Number of instructional days	64 days/12.8 weeks
First day of winter classes	Wednesday Jan 5
Last day of Q3 courses	Friday Feb 18
Reading Week	February 21-25
First day of Q4 courses	Monday Feb 28
Q3 final exams	Feb 28-Mar 4
Last day of winter classes	Monday April 11
Exam Study Period	Tuesday April 12
Winter Exams Start	Wednesday April 13
Good Friday	Friday April 22
UofT Holiday	Monday April 25
Winter Exams End	Friday April 29
Number of instructional days	64 days/12.8 weeks

**APSC may potentially hold exams on Saturdays during the exam period and during the evenings

It was moved and duly seconded

THAT the proposed session dates for 2010/2011 be approved.

A member indicated that in light of this year's compressed exam schedule, only one more day was added to the exam schedule next December. He indicated that this would continue to be a difficult exam time for students. He suggested that as this arises every seven years, that the Faculty has a plan ready and in place.

A member responded that the constraints are often set by the University or by the calendar.

The question was called. The motion was carried.

6. Reports of Standing Committees

6.a) Engineering Graduate Education and Research Committee

The attached report (#3238) of the Graduate Education and Research Committee had been circulated in advance and was received for information.

6.b) Committee on Admissions

The attached report (#3239) of the Committee on Admissions had been circulated in advance and was received for information.

7. Reports of Special Committees

7.a) Task Force on Globalization: Final Report

The final report of the Task Force on Globalization had been circulated in advance and was received for information

7.b) Divisional Space Review and Development of a Master Plan: Final Report

The final report of the Divisional Space Review and Development of a Master Plan had been circulated in advance and was received for information

8. Report # 3240 of the Academic Appeals Board

The attached report (#3240) of the Academic Appeals Board had been circulated in advance and was received for information.

A member indicated that at a future Faculty Council meeting it would be helpful to receive information on the patterns of academic appeals heard by the Board.

9. Other Business

There was no other business.

10. Next Meeting

The date of the next Faculty Council meeting was announced as being Wednesday, February 24, 2010.

11. Adjournment

The meeting adjourned at 1:40 p.m.