



To: Faculty Council

From: Professor Bryan Karney
Member, Working Group to Explore Concept of a Centre

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Item: Proposal to Establish a Centre for Global Engineering in the Faculty of Applied Science and Engineering of the University of Toronto as an Extra-Departmental Unit C (EDU:C)

1. Overview

In the first half of 2008 the Dean's Task Force on Globalization and Engineering recommended exploring the creation of a centre to focus the Faculty's activities on global engineering issues. A working group consisting of Phil Byer, Yu-Ling Cheng, Bryan Karney and Murray Metcalfe was established to explore the concept of a centre. It has submitted this proposal to Dean Amon to create the Centre for Global Engineering ("CGEN") within the Faculty of Applied Science and Engineering. It is proposed that the Centre be formed and organized as an EDU:C type of extra-departmental unit. This proposal describes the key elements of the proposed Centre, the structure of the Centre, its initial resources, and future measures of success of the Centre.

2. Key Elements of the New Centre

2.1 Background and Motivation

In early 2008, Dean Cristina Amon, in consultation with the Chairs and Directors of the Faculty of Applied Science and Engineering, formed a Task Force on Globalization and Engineering to consider how the Faculty's education and research missions should take into account globalization trends and global challenges. In an interim report of June 2008, the Task Force made numerous recommendations, many of which are being implemented now. One of the recommendations was to form a centre to focus the Faculty's activities on global engineering issues. Since January 2009, the working group has met regularly to consider the scope of possible activities in such a centre, organized a speakers series to help define the scope, made connections with many University of Toronto departments and external organizations as potential partners, engaged faculty and students to assess the level of interest in such a centre and communicated with the Faculty's Advancement Office to

assess potential advancement opportunities. Additionally, a course with an explicit global effort was launched and plans are in place to offer that course again and to launch a new course specifically on the topic of engineering and international development. Furthermore, Dr. Murray Metcalfe, an alumnus of the Faculty who has been a central part of the globalization activities in the Faculty has been appointed as an adjunct Professor, Globalization.

With these early efforts alone, the level of engagement has been very promising. The lectures in the speaker series each drew at least 25 audience members, with some reaching attendance of 60. Two planning sessions with faculty members each attracted over 10 participants. Additionally, student groups have been convened to meet on various globalization related topics; the Engineers Without Borders student chapter has been particularly engaged in this process.

The new course on global energy systems had 17 students enrolled in its pilot version, plus several graduate student auditors; the course attracted Rotman School students as well as undergraduate and graduate students from the Faculty. In general, the interest and support within the Faculty has been broad and enthusiastic. The possible existence of a centre has already led to interest in collaboration from potential internal UofT and external partner organizations. The proposed centre has been asked to participate in specific educational and research programs.

2.2 Academic Mission

CGEN will play a key role in both the education and research mission of the Faculty by promoting interdepartmental and interdivisional research and other scholarly activities related to engineering in a global environment. CGEN's activities will be carried out by existing faculty, working with internal (i.e. UofT) and external partners. In early discussions, some faculty expressed strong interest in being connected with NGO's to help identify needs that their research can help meet and others expressed the wish for our Faculty to be seen as a leader in technology research and development that address global issues – including issues of the environment and of the bottom of the pyramid. Accordingly, CGEN members will conduct research that is either: (1) discipline specific research projects with relevance to global issues, and/or (2) research in knowledge translation or diffusion of innovation in the engineering context. The second research area will directly address the question of how to enhance the global impact of research activities in the Faculty.

On the education side, CGEN will help to enhance the global experience of students. Faculty affiliated with CGEN will contribute to the education mission by: teaching courses, supervising design projects or undergraduate and graduate theses with international content, participating in the development of academic initiatives including undergraduate minors and graduate certificate programs, and serving as links to departments outside the Faculty who may be beneficial partners in the Faculty's global programs. The courses taught by CGEN members may serve as core or elective courses in an undergraduate minor in global engineering and a graduate certificate program in global engineering currently

under development. It is important to note that while faculty affiliated with CGEN will carry out these educational initiatives as part of their responsibilities to their home departments, the existence of CGEN will centralize these efforts and present a focal point within the Faculty for students, faculty and the broader UofT and external community.

2.3 Benefits of a Centre for Global Engineering

CGEN will be a community of scholars who share an interest in global engineering issues – a mechanism for exchanging ideas and sharing best practices that will potentially influence research directions to increase alignment with global challenges as well as enhance the global impact of the research. The Centre will also be the face of global engineering to both internal and external communities. Students will see it as the focal point of the Faculty’s educational initiatives related to global engineering. The presence of CGEN will identify to potential external partners that research and educational activities on global issues exists within the Faculty, and will thus lead to collaborative opportunities. CGEN will also serve as a focal point for advancement opportunities.

2.4 Aligning CGEN with *Stepping Up* and Top Level UofT Priorities

Formation of CGEN aligns closely with the five key priorities in the university’s strategic plan *Stepping Up*. It will ***improve the quality of student experience*** by providing students with more international opportunities, and enrich students’ understanding of the world through new course offerings and program options. CGEN will also ***provide a multi-disciplinary, interdepartmental and interdivisional environment***. The planning activities of the working group have included faculty and students from all departments within the Faculty, and outreach has been made to departments in Arts and Science, Rotman School of Business, School of Governance and Public Policy, St. Michael’s Hospital and the Li Ka Shing Knowledge Institute, Sick Children’s Hospital and the Departments of Pediatrics and Nutrition. Addressing global challenges requires a systems approach, and CGEN will build a multi-disciplinary environment that cuts across departmental and divisional boundaries. CGEN core and affiliate faculty will serve as graduate supervisors, thus CGEN will ***link the Faculty’s graduate and professional programs to strong research experience*** by providing research opportunities to students interested in global engineering research topics. CGEN will be a natural focal point for ***outreach to the global community***. Finally, the global outlook that CGEN will champion will be inclusive of different culture and people of different economic means, thus CGEN ***activities will support equity and diversity***.

More generally CGEN’s goals align with the current interests of the University administration in global topics and initiatives (see for example President Naylor’s editorial entitled “We must prepare UofT for a borderless world,” *UofT Magazine*, Spring 2009). It also can help increase the visibility of the critical role of engineering and the Faculty specifically within other UofT global initiatives.

3. Structure of the Centre

3.1 EDU:C Status and Faculty Complement

It is proposed that CGEN be established as an EDU:C type of extra-departmental unit. As an EDU:C, CGEN will not be authorized to make primary teaching appointments, but may hold cross-appointed faculty.

3.2 Academic Programs

As an EDU:C, CGEN will not offer academic programs, but cross-appointed faculty in CGEN may offer courses that are core or elective courses in appropriate programs.

3.3 Administrative Structure

It is proposed that CGEN be established with its own administrative budget and the authority to administer research grants, and to serve as the administrative home for such research projects in appropriate areas by CGEN members.

As an EDU:C, the Director will be appointed for a fixed term by the Dean of the Faculty of Applied Science and Engineering. The Director will report administratively to the Dean of the Faculty of Applied Science and Engineering. The Dean will undertake reviews at intervals corresponding to the appointment or re-appointment of a Director. Reviews will be based on benchmarks for success as described in Section 5.

4. Resources

Modest initial administrative funding for the Centre will be provided by the Faculty of Applied Science and Engineering. The initial funding will cover expenses such as the Centre's seminar series for the 2009-2010 academic year, a part-time administrative assistant and the employment of work-study students. Future funding sources will expand through advancement initiatives and funds from research initiatives initiated and administered by the Centre.

The Faculty will provide space for the initial operations of the Centre and will assist the Centre in identifying increased space if expansion of the Centre's activities warrants more space in the future.

5. Benchmarks and Measures of Success

The success of the Centre will be measured by its ability to engage faculty and students, its ability to enhance Faculty's educational offerings and the global impact of the Faculty's research, and on the global visibility it brings to the Faculty. Specifics measures of these achievements might include:

- International recognition as a leading research and educational entity in the field of engineering and globalization; seen as mounting innovative programs and initiatives
- Broader visibility as an education and research entity beyond engineering faculties and beyond North America
- The number of core and affiliate members CGEN attracts
- Quality of speakers CGEN is able to attract to its planned Speakers Series and the quantity and quality of faculty and student participation at the seminars
- Student enrollment in courses offered by CGEN members
- Number and quality of partnerships CGEN develops with organizations/units internal and external to the University of Toronto, particularly international partners
- Enhanced opportunities for global student experiences
- CGEN members' ability to attract research funding and produce research output
- Number of graduate students who participate in CGEN research projects