UNIVERSITY OF TORONTO
FACULTY OF APPLIED SCIENCE & ENGINEERING

Report No: 3269

To: **Faculty Council**

From: **Dr. Graeme Norval**
Chair, Undergraduate Curriculum Committee

Date: **October 25, 2010**

Item: **Proposed Undergraduate Academic Certificate: Global Engineering**

BACKGROUND:

A Global Engineering Certificate is proposed. It will require considerable personal commitment equivalent to three courses, or half a minor. Progress and achievement toward the Undergraduate Academic Certificate will not appear on a student's official record but will be maintained by the Cross-Disciplinary Office and once achieved, can be claimed on a student's resume and CV.

PROCESS:

The Certificate has been brought forward by the Cross-Disciplinary Office to Chairs and Directors and the Undergraduate Curriculum Committee.

STRUCTURE:

The three courses would be the current APS510 Technologies and Organizations in Global Systems, plus a new course APS520 Technology, Engineering and Global Development (renumbered from a 1000 level course), plus one additional humanities and social science/complementary studies elective from an approved short list to come forward in the spring of 2011.

PROGRAMS/COURSES:

APS510H1F – Technologies and Organizations in Global Energy Systems
This course presents and discusses a broad range of global energy systems (including electricity generation, electricity end use, transportation and infrastructure) that are emerging based on two key trends: (a) the increasing ability to deploy technologies and engineering systems globally, and (b) innovative organizations, many driven by entrepreneurship (for profit and social) and entrepreneurial finance techniques. The course considers these types of innovations in the context of developed economies, rapidly developing economies such as India and China, and the developing world. The course will interweave a mix of industry examples and more in-depth case

studies. The result will be a matrix (not necessarily completely filled in) along the three dimensions of type of technologies, types of organizational structure, and development level of the country or region. The examples and cases are examined with various engineering, business and environmental sustainability analysis perspectives.

APS520H1S – Technology, Engineering and Global Development
The role of technology and engineering in global development is explored through a combination of lectures, readings, case studies, and analysis of key technologies, including energy, information and communications technologies, water, and healthcare. Topics include a brief history and basic theories of international development and foreign aid, major government and non-government players, emerging alternative models (social entrepreneurship, microfinance, risk capital approaches), major and emerging players in social venture capital and philanthropy, the role of financial markets, environmental and resource considerations/sustainable development, technology diffusion models and appropriate technologies.

PROPOSAL/MOTION:

Recommendation and Motion for Faculty Council:

"THAT the Faculty establishes a Global Engineering Certificate and that its associated APS courses be approved."