



MEMORANDUM

To: Executive Committee of Faculty Council

From: Dr. Graeme Norval
Chair, Undergraduate Curriculum Committee

Date: March 12, 2014 for April 7, 2014 Faculty Council Meeting

Re: **Proposed Summer Research Abroad Course APS299Y0Y**

REPORT CLASSIFICATION

This is a major policy matter that will be considered by the Executive Committee for endorsing and forwarding to Faculty Council for vote as a regular motion (requiring a simple majority of members voting to carry).

BACKGROUND

Undergraduate students at the University of Toronto have a variety of options for international exchanges. The Faculty of Applied Science & Engineering receives many more students on exchange than are sent abroad (exclusive of the *Science Without Borders* students). Over the past few years, the Faculty has worked to make international exchanges simpler. Despite the many advantages of an international experience, and the financial support from the Centre for International Experience (CIE), the number of engineering students doing any form of exchange remains low. This proposal provides academic credit for students participating in the Summer Research Abroad program, and is modeled on a similar course run by many of the science departments at this University.

STRUCTURE

Undergraduate students at the University of Toronto have a variety of options for international exchanges. The University's exchange partners are spread around the world. A large number of University of Toronto students take advantage of the opportunities, and the same number of students travel here for course and research work.

Despite this, the Faculty of Applied Science & Engineering sends a small number of students abroad. Indeed, substantially more engineering students travel to Toronto for exchange than those who travel from Toronto. The recent influx of *Science Without Borders* students is a case in point—more students have traveled here from Brazil than have traveled from the Faculty. The table below presents the numbers of students who have travelled abroad for the past six years.

Year	Outboard – Coursework	Outbound – Summer	Total
2013/14	8	Not yet available	8+
2012/13	30	35	65
2011/12	11	24	35
2010/11	13	17	30
2009/10	13	25	38

Undergraduate enrollment in the Faculty is ~5200 students. First year students are not eligible for the exchange program. But, even removing these students from the eligible pool, less than 1% of students take advantage of the opportunity. Students in FASE have been traveling abroad for summer research for many years. The Faculty could send many more students abroad annually. Even with generous financial support from CIE, the Faculty has been unable to see a dramatic increase in the number traveling abroad.

A number of programs at the University of Toronto offer courses for academic credit for students who travel for a summer research abroad program. Those students wishing the academic credit must:

- a) apply for Summer Research Abroad through the Centre for International Experience,
- b) be accepted by a partner institution, then
- c) register for the course, and
- d) prepare and submit the required research reports to their academic host.

Students are not required to register for the course in order to take part in the Summer Research Abroad program; those who wish only to be part of the research perform steps a) and b). Those who do register for the course will be charged the course fee. Further, all students who wish to be part of any exchange through CIE must have the prior approval of their home program.

It is proposed that the Faculty create the course APS299Y0Y: Summer Research Abroad. The course will provide academic credit for the existing Summer Research Abroad program. Students will be required to register for Summer Research Abroad through CIE (restricted to students with a CGPA > 3) with one the Faculty's research on exchange partners. Once accepted, the student can choose to register for the course.

The overseas institution and the student's home program would jointly evaluate the student's work abroad.

Course evaluation expectations would be along the lines of the following reports:

- 1) Research Proposal (1-3 pages) – 25%
- 2) Research Journal – 10%
- 3) In-Lab Research Performance – 25%
- 4) Final Report (~10-20 pages) – 40%

The overseas research supervisor would evaluate the student's work, and a copy of these reports would be provided to and reviewed by a representative from the home program (Undergraduate Associate Chair) or from the Faculty (TBD).

This is a technical course, and would count as two technical electives. Not all programs are able to provide two unrestricted technical electives; for those programs, the course could occupy a free elective slot, and/or be counted as an extra course. The individual programs will determine how the course will be credited, and students will be directed to speak with their counselor. The required stay at the foreign institution will be 10 – 16 weeks.

For CEAB accreditation purposes, the AU count for the course will be registered as 100% Engineering Science, as a default, with the understanding that this value could be adjusted for any specific project, following receipt of the final report. It is noted that the AU breakdown, and the licensure status of the supervisor, is not an issue for students whose programs follow a minimum path approach. Further, the students will be allowed to count these hours as part of the Practical Experience Requirement.

The committee has discussed the possibility of a technical elective for summer research done on the University of Toronto campus. The committee notes that each program has a thesis course, and some have both half year and full year thesis courses. In addition, the Faculty has a summer session. All programs are able to run summer research thesis courses, with no additional governance approval. Given that not all programs are able to provide technical elective slots for this course, and given that a thesis course can be offered in the summer, the committee is not prepared to advise on a summer credit course for research on the University of Toronto campus.

PROCESS

The Committee is composed of representatives from each program; the Vice-Dean, Undergraduate Studies; the Chair, First Year; the Associate Dean, Cross-Disciplinary Programs; and the Registrar's Office. The Committee meets regularly, and reviews changes to the curriculum.

PROGRAM

All programs are involved in these changes, and the impact on students in the various programs has been considered.

PROPOSAL/MOTION

Recommendation and Motion for Faculty Council:

THAT the proposed APS299Y0Y: Summer Research Abroad course be approved, effective May 1, 2014.

APPENDIX A: CURRENT LIST OF ENGINEERING SUMMER RESEARCH PARTNERS

National University of Singapore
Departments: Open (including Engineering Science)

University of Strathclyde
Departments: Chemical Engineering; Mechanical Engineering

Technion-Israel Institute of Technology
Departments: Open (including Engineering Science)

University of Stuttgart
Departments: Open (excluding Engineering Science)

Lund University
Departments: Open

Hong Kong Institute of Science and Technology
Departments: Open (excluding Engineering Science)

Chinese University of Hong Kong
Departments: ECE

University of Ulm
Departments: Open

RISE - DAAD (German Scholarship Foundation)
Departments: Open (including Engineering Science)

University of Hamburg – contact Division of Engineering Science for details
Departments: Engineering Science

ETH Zürich – contact Division of Engineering Science for details
Departments: Engineering Science

Osaka University – contact Division of Engineering Science for details
Departments: Engineering Science

University of Cambridge – contact Division of Engineering Science for details
Departments: Engineering Science

APPENDIX B: CURRENT LIST OF FASE EXCHANGE PARTNERS

<p>Australia Australian National University University of Adelaide University of Melbourne University of New South Wales University of Queensland University of Sydney University of Western Australia</p>	<p>Estonia University of Tartu</p>	<p>Korea (South) Korea University Korean Advanced Institute of Science and Technology Seoul National University Yonsei University</p>
<p>Austria University of Graz</p>	<p>France Lyon 1 (Claude Bernard University) Ontario/Rhône-Alpes Program (ORA)</p>	<p>Mexico Technical University of Monterrey (NARETI) University of Guadalajara (NARETI)</p>
<p>Barbados University of the West Indies (Cave Hill)</p>	<p>Germany DAAD Scholarship Program Humboldt University at Berlin Ontario/Baden-Württemberg Program (OBW) University of Bonn University of Konstanz University of Stuttgart University of Ulm University of Mannheim</p>	<p>Netherlands Delft University of Technology</p>
<p>Brazil Universidade Estadual Paulista Julio de Mesquita Filho (UNESP) University of Sao Paulo</p>	<p>India India Institute of Technology, Kanpur Indian Institute of Technology, Bombay Ontario/Maharashtra-Goa Program</p>	<p>New Zealand University of Auckland University of Otago</p>
<p>Canada McGill University University of British Columbia</p>	<p>Ireland Trinity College, Dublin</p>	<p>Norway University of Oslo</p>
<p>China Beihang University Chinese University of Hong Kong Fudan University Hong Kong University of Science & Technology Peking University Shanghai Jiao Tong University Tianjin University Tsinghua University University of Hong Kong</p>	<p>Israel Technion-Israel Institute of Technology</p>	<p>Scotland University of Edinburgh University of Glasgow University of Strathclyde</p>
<p>The Czech Republic Masaryk University</p>	<p>Italy University of Siena University of Pavia (civil engineering graduate students)</p>	<p>Singapore Nanyang Technological University National University of Singapore</p>
<p>Denmark University of Aarhus</p>	<p>Jamaica University of the West Indies (Mona)</p>	<p>Sweden Lund University Uppsala University</p>
<p>England Herstonceux Castle (CUSAP) King's College, London Lancaster University Loughborough University University College, London University of Birmingham University of Leeds University of Liverpool University of Manchester University of Nottingham University of Sheffield</p>	<p>Japan Keio University Kyoto University Nagoya University Nihon University Waseda University Osaka University University of Tokyo</p>	<p>Switzerland Swiss Federal Institute of Technology Zurich</p>
		<p>Taiwan National Taiwan University</p>
		<p>Thailand King Mongkut's University of Technology Thonburi</p>
		<p>Trinidad and Tobago University of the West Indies (St. Augustine)</p>
		<p>United States of America Killam Fellowships Program Marquette University (NARETI) University of Illinois at Chicago (NARETI)</p>