May 12, 2009

NOTICE OF MEETING
Graduate Education Council

To: Members of Graduate Education Council
From: Jane Alderdice, Secretary, Graduate Education Council

This is your notice of the Graduate Education Council meeting on May 19, 2009 in the Council Chamber, Galbraith Building, Room 202, 35 St. George Street.

If you have any questions or comments about the attached agenda, or wish to send regrets, contact Mr. Anil Purandaré, SGS Governance Officer, at 416 946-3427 or sgs.governanceofficer@utoronto.ca. If you would like to discuss any aspect of Council business, I would be pleased to hear from you at jane.alderdice@utoronto.ca.

[SIGNED]
AGENDA
Graduate Education Council

Tuesday, May 19, 2009
3:00 PM - 6:00 PM
The Council Chamber, Galbraith Building
Room 202, 35 St. George Street

Regrets only to Anil Purandaré, SGS Governance Officer: 416-946-3427 or sgs.governanceofficer@utoronto.ca

1 Minutes of the Graduate Education Council Meeting of April 21, 2009
   (Documentation attached)

2 Business Arising from the Minutes

3 Dean’s Remarks

4 Report of the Vice-Dean, Programs

5 Report of the Vice-Dean, Students

6 Graduate Academic Appeals Board (GAAB): Approval of Membership for 2009-2010
   (Documentation attached)

7 New Degree Program: Master of Science in Applied Computing program, MScAC
   (Documentation attached)

8 Disestablishment of Degree Program: Master of Engineering in Telecommunications program, MEngTel
   (Documentation attached)

9 Disestablishment of Collaborative Program: Collaborative Program in Health Care, Technology and Place
   (Documentation attached)

10 Degree Name Change: Public Health Sciences program: from Master of Health Science (MHSc), to Master of Public Health (MPH)
   (Documentation attached)
11 Assignment of Hood: Public Health Sciences program: Master of Public Health (MPH) degree
(Documentation attached)

12 Program Requirement Changes:
(Documentation attached)

12.1 Biochemistry, MSc, PhD
12.2 Occupational Science and Occupational Therapy, MScOT
12.3 Rehabilitation Science (Practice Science field), PhD

13 Other Business

14 For Information:
(Documentation attached)

14.1 Graduate Education Council: Spring 2009 Election Report
14.2 Mathematical Finance, MMF: Administrative Transfer of Program from SGS to the Faculty of Arts and Science
The meeting was called to order at 3:00 p.m. Dean Susan Pfeiffer welcomed members and visitors. The Dean called for a motion to adjourn no later than 5:00 p.m.

**MOTION (duly moved and seconded)**

THAT the Graduate Education Council meeting of **April 21, 2009** will adjourn no later than **5:00 p.m.**

The motion was **CARRIED**.

**Approval of the Agenda of the Graduate Education Meeting of April 21, 2009**

**MOTION (duly moved and seconded)**

THAT the agenda of the Graduate Education Council meeting of **April 21, 2009** be approved.

The motion was **CARRIED**.

1. **Minutes of the Graduate Education Council Meeting of February 17, 2009**

The minutes of the **February 17, 2009** meeting were distributed with the agenda.

**MOTION (duly moved and seconded)**

THAT the minutes of the Graduate Education Council meeting of **February 17, 2009** be approved.

The motion was **CARRIED**.

2. **Business Arising from the Minutes**

2.1 **Subsequent Considerations of GEC-approved items**

**Centre of Criminology: Disestablishment/Reestablishment**

On October 21, 2008, GEC approved a proposal to disestablish the Centre of Criminology as an EDU:A within SGS and re-establish it as an EDU:A within the Faculty of Arts and Science, effective May 1, 2009. It has since been approved by Governing Council at its March 4, 2009 meeting. This constitutes final approval.
Health Administration (M.Sc., Ph.D.): Name Change
On January 20, 2009, GEC approved a proposal to change the name of the Health Administration (M.Sc. and Ph.D.) program to Health Policy, Management and Evaluation (M.Sc. and Ph.D.). It has now received approval from OCGS; this constitutes final approval.

3 Dean’s Remarks

3.1 Introduce Material for Academic Board Representative Election (Item 6)
The Dean explained that the meeting would be dealing with the election of the SGS Academic Board representative for Divisions I and II as item 6. Professor MacNeil’s curriculum vitae was circulated at the beginning of the meeting on salmon-pink paper for review. Professor MacNeil has indicated her willingness to serve in this capacity.

The Procedures for Selecting SGS Members of the Academic Board of Governing Council, July 2007 were followed – see the motion sheet for more details. The Standing Committee on Program Matters approved the recommendation at its meeting on April 7, 2009. As there was only one nomination, the recommendation is for acclamation.

3.2 Faculty of Arts and Science, School of International Studies – Name Change to “School of Global Affairs”
The Dean brought to members’ attention a name change for the School of International Studies in the Faculty of Arts and Science – the new name is “School of Global Affairs”; the change is effective immediately. It was approved by Academic Board at its March 26, 2009 meeting and confirmed by the Executive Committee of Governing Council on April 6, 2009; this constitutes final approval.

3.3 Graduate Application Fee
The Dean advised members that the SGS application fee will increase from $100 to $110 commencing in the 2009-10 academic year. Along with this, distribution of the funds is being adjusted with a larger proportion of the funds going to the units receiving the applications and SGS taking a smaller proportion.

Current Breakdown: 60 percent ($60) has been retained by SGS, 15 percent ($15) was conveyed to each graduate unit directly, and 25 percent ($25) has been retained in general University revenue (from which it was attributed back to each Faculty through the new budget model process).

Breakdown for 2009-10: 46 percent ($50) will be retained by SGS, while the remaining 54 percent ($60) will be retained in General University revenue, whence it will be attributed back to each division through the new budget model process.

This change received final approval from the Office of the Vice-Provost, Planning and Budget, and was reported for information at Business Board on March 23.

In response to a question about whether graduate unit chairs had been consulted or not, the Dean explained that there was considerable consultation with the Deans responsible for graduate studies at the Faculty level. It will be up to the Faculties to decide how to share the funds with the departments.
3.4 Post-Doctoral Fellows (PDF) and the Canada Revenue Agency (CRA) Update
CRA continues to deliberate the question of taxable income for postdoctoral fellows (PDFs). The matter remains unresolved for the 2008 tax year. The University is aware that a lack of clarity remains and will continue to work on clarifying this issue.

In response to a question as to whether the query included PDFs in hospitals, the Dean said that the query had been put very broadly.

3.5 Application and Admission Update
As of last week, SGS has received 22,000 applications for next year’s enrollment, compared to 20,300 last year at this time. There are also 1,700 confirmed new students compared to 1,100 at this time last year across all categories (master’s, doctoral students, etc.). There is a common perception that during economic downturns, fewer applications may be expected, especially at the doctoral level. This is not the case, as our application and enrollment numbers are clearly higher, most dramatically for professional master’s programs.

3.6 CGPSS Survey
Two CGPSS survey tools will be used in next year’s survey, one for doctoral stream graduate students and another for students in professional graduate programs. This will reduce inappropriate questions for some respondents. The decision of which survey to administer will be based on the degree. The survey will be available for review soon.

3.7 GEC Election Update
The spring election to fill seats on GEC is underway. Balloting is occurring in the Div. IV (Life Sciences) Faculty constituency. The deadline to vote is Monday, April 27. A report will be provided in May.

One faculty and three student seats remain vacant. There will be a by-election to fill remaining vacancies in September 2009.

A member noted that in the Div. IV Faculty election, voters were e-mailed a ballot and asked to print it out, obtain their own envelopes for mailing and privacy, and return the ballot to SGS, and further noted that this was an onerous process for some voters. The member asked whether this was being done out of a desire to economize and whether electronic voting would be considered in future. In response, the Dean said the process had not been chosen in order to cut costs. She explained that SGS has the ability to conduct elections electronically in student constituencies but not yet in others. She expressed her hope that this ability would soon be extended to the other constituencies, as she agreed the current process was less than ideal. She also added that mailing ballot packages had been pursued but it had proven unfeasibly difficult to obtain appropriate mailing addresses for faculty.

3.8 Next GEC Meeting
The next GEC meeting will be followed by a reception to celebrate the end of the academic year. The reception will take place at Massey College. The Dean expressed her hope that members would hold a little time at the end of the meeting next month for some relaxation.

4 Report of the Vice-Dean, Programs
4.1 **Appointing Senior Research Associates and Librarians with Permanent Status to Graduate Faculty**

Vice-Dean Elizabeth Cowper informed Council that SGS, in consultation with the Office of the Provost and Deans of Faculties, is trying to regularize who is eligible for appointment to Graduate Faculty. Previously this has only been allowed for teaching-stream faculty members (full, associate, adjunct, etc.). Eligibility for appointment is now being extended to two additional categories: Senior Research Associates (SRA) who are appointed in a continuing way (usually on larger research grants), and Librarians who have permanent status (i.e. Librarian III and higher).

In response to a question, Vice-Dean Cowper clarified that it is expected that SRAs and Librarians will normally be appointed to Graduate Faculty with Associate rather than Full status; the main practical difference is that they would not have direct responsibility over a doctoral student as this would be unusual for someone without tenure. This is the purview of graduate unit chairs (and not graduate coordinators, etc.), as usual.

A member commented that this could have a large impact on clinical departments, as most labs have an SRA, and this could result in a flood of requests from people who might not be deemed appropriate for Graduate Faculty appointments. Vice-Dean Cowper explained that the change was purely permissive, and that graduate unit chairs had the authority to extend or not extend graduate faculty membership to their unit’s SRAs. The Vice-Dean added that in order to be eligible, SRAs and Librarians needed a valid University of Toronto appointment.

In response to a question, Vice-Dean Cowper clarified that the definition of SRA could be found in the University of Toronto Policy, Procedures and Terms and Conditions of Appointment for Research Associates (Limited Term) and Senior Research Associates.

5 **Report of the Vice-Dean, Students**

5.1 **Graduate Professional Skills Program**

Vice-Dean Berry Smith reported to Council that the “soft” launch of the Graduate Professional Skills (GPS) program in May is on schedule. The program’s intent is to harness existing resources around the University, i.e., those units that currently mount workshops, courses, seminars and other activities to enhance the student experience and prepare students for life after graduate school. The GPS Program Committee includes representatives from Graduate Faculty, students, SGS, U of T Student Life, and other University offices. The committee met recently and reviewed 36 proposals from ten different bodies around the University. The program will require students to complete credits in three of the four program areas (communication, teaching, research, and personal effectiveness), equivalent to a half-course. A more high-profile launch of the program is planned for September. Students can begin to take offerings and count them towards the program in May; it is even possible that some students may be able to complete the program in time for November convocation. Announcements will be made in early May; all graduate students and graduate programs will be contacted with details.

In response to a question, Vice-Dean Smith clarified that the GPS program was entirely optional for students and that it was intended to provide added value to their studies but not to replace any component of their academic program. Students who complete the program will receive a notation on their transcript.

5.2 **Bologna Process Conference**

Vice-Dean Smith informed members that earlier this year, he had attended a conference in Edmonton, Alberta on the Bologna Process and its impact on higher education especially in
Canada. He urged members to become familiar with the Bologna Process if they were not already, as it is beginning to have a huge impact worldwide.

The Bologna Process began in 1998 and now has 46 European countries who have agreed to its broader outlines; its overall goals are threefold (1) to improve the mobility of students and faculty; (2) to make higher education more transparent and harmonized; and (3) to make its graduates more attractive. The process is well-developed and has had some remarkable effects. For example, RWTH Aachen University has transformed its higher education programs to include a three-year undergraduate and two-year master’s program. Most institutions are moving to a three-year undergraduate, two-year master’s and three-year doctoral series of programs.

Three major effects for Canada have been identified by the Association of Universities and Colleges of Canada (AUCC). First, it may create a decreased market share in Canadian education. Second, it creates issues in determining equivalency between Canadian degrees and those of institutions under the Bologna Process. Third, while it increases mobility of students within Europe, it may have a serious impact on opportunities for exchange and study-abroad programs for those outside Europe, including Canada.

The Bologna Process is just the beginning. There are similar initiatives underway in South Asian countries, Australia and New Zealand, South America, and Africa.

A member noted that allowing a three-year undergraduate degree requires certain assumptions about incoming undergraduates’ high-school education. Vice-Dean Smith responded that this was quite true, and that high-school education ought to be considered in interpreting undergraduate degrees. He also noted that the Bologna Process places great emphasis on learning outcomes for students rather than on measuring years in the system, and that it proposed a diploma supplement which is supposed to be an understandable explanation of what the student has achieved, to help understand transcripts.

6 Academic Board Representative Election
The supporting material for this item was introduced in the Dean’s remarks under item 3.1. The Dean called on Vice-Dean Cowper to present the motion.

**MOTION** *(duly moved and seconded)*
THAT Graduate Education Council approve the recommendation of the Standing Committee on Program matters for the appointment of Professor Heather MacNeil, Faculty of Information, as the SGS representative on the Academic Board for Divisions I and II for a two-year term commencing July 1, 2009.

There being no discussion, the Dean called the question.

The motion was **CARRIED**.

7 New Regulation: Submission of Theses (electronic)
The proposal has been discussed within the School of Graduate Studies and posted on the SGS Graduate Webposting System for the normal fourteen day period. The following two comments were received.

It was asked if there were official requirements for students in a Collaborative Program to provide the collaborating program or department with a copy of the thesis (the proposed electronic submission would make this much easier). There is no SGS guideline that requires students to submit a copy of their thesis to their Collaborative Program or department; this is at the discretion of the
graduate unit. SGS documentation does encourage students to find out about all the thesis submission requirements to which they might be subject.

*It was asked if there would be a requirement for departments to retroactively post thesis documents electronically.* SGS will be seeding the electronic thesis repository with electronic thesis documents dating back to 1998. SGS is unable to include theses from before 1998 as explicit permission to mount them electronically was not given. At this time, SGS is not planning to contact alumni or departments to retroactively post pre-1998 theses electronically.

GEC approval is final. It will be reported to the Office of the Provost for information. The Dean called on Vice-Dean Smith to present the motion.

**MOTION (duly moved and seconded)**

**THAT** Graduate Education Council approve the proposal of the School of Graduate Studies (SGS) to replace the “Graduation and Submission of Thesis” section of the General Regulations in the SGS Calendar with the attached “Submission of Theses” text. This change requires each student to submit an electronic version of the final thesis and eliminates the option of submitting a paper copy, effective September 2009.

A member noted that there is currently a pilot project to test feasibility of electronic submission of theses. The member asked what the percentage of students who have chosen to submit theses electronically as part of the pilot was, and what feedback had been received. Vice-Dean Smith replied that the pilot project had been in place about one and a half years. About 80 percent of Ph.D. theses are being submitted electronically versus about 40 percent of master’s theses; both percentages are increasing. The difference between the two is explained by the fact that Ph.D. theses are submitted directly to SGS, while master’s level theses are submitted locally and then to SGS; SGS thus has more input into submission of Ph.D. theses. SGS has received strong support for electronic thesis submission. Students appreciate being able to deposit their theses directly into the University’s “T-Space” thesis repository. They also benefit from being able to add supplementary files to their theses. SGS has a team monitoring use of the T-Space and providing assistance to students who need it, but students appear to encounter few difficulties in using the system.

Another member observed that some departments require students to submit paper copies of theses and asked whether is this regulated. Vice-Dean Smith answered that submission of paper theses is optional at the departmental level, but copies submitted to SGS will have to be electronic under this proposal.

In response to a question from a member, Vice-Dean Smith clarified that the regulation applies to all theses, including those at the master’s and doctoral levels.

A member pointed out that many journals ask for confirmation that material has not been published previously. The member enquired whether and how issues related to the electronic publishing of information (i.e. the thesis) that is not yet published in a journal would be handled. Vice-Dean Smith explained that such issues already exist with paper publication of theses; the apparent difference is one of scale. That is, a perception exists that there is a difference between a thesis sitting on a library shelf and a thesis immediately available on T-Space. Mitigating this, students can restrict publication for up to two years in the electronic system just as they can with paper publication. The electronic system also allows more flexible publication, such as inserting a placeholder for certain sections. University Microfilms International (UMI) is advocating on behalf of universities moving to electronic thesis publication; the National Archives of Canada are also fully supportive of such initiatives.
Issues with publishers will be dealt with on a case-by-case basis. SGS does not foresee serious problems.

As there was no further discussion, the Dean called the question.

The motion was CARRIED.

8 Regulation Change: Academic Appeals: Informal Mediation
The change was posted on the SGS Graduate Webposting System for comment for the normal fourteen day period. No comments were received. With GEC approval, the proposal will be sent for approval by the Academic Policy and Programs Committee of Academic Board. The Dean called on Vice-Dean Smith to present the motion. A revised motion sheet was distributed to all members at the start of the meeting on yellow paper. The revised motion uses language that makes the intent of the motion clearer.

Revised MOTION (duly moved and seconded)
THAT Graduate Education Council approve the proposal of the School of Graduate Studies (SGS) to change the Academic Appeals: Informal Mediation section of General Regulations in the SGS Calendar as detailed in the attached extract from the SGS Calendar, in order to:

- allow students to seek mediation or advice from the SGS Vice-Dean at any stage before filing and until the hearing of any appeal, and
- formalize the existing practice whereby, if there is a perceived or actual conflict of interest with the Vice Dean, the student will have access to an alternate mediator.

This change is effective immediately.

Vice-Dean Smith thanked the Graduate Student’s Union (GSU) for assistance in clarifying motion language. The President of the GSU said the GSU was appreciative of the speed with which SGS had responded to its suggestion. There being no further discussion, the Dean called the question.

The motion was CARRIED.

9 Disestablishment and Re-establishment of Units:

9.1 Industrial Relations and Human Resources, Centre for
The proposal arose out of a recommendation from an internal SGS review of the Centre undertaken in October 2008. The Faculty of Arts and Science approved the establishment of the Centre for Industrial Relations and Human Resources as an EDU:A within the Faculty at its Faculty Council meeting on April 6, 2009.

If approved by GEC, the proposal for the disestablishment within SGS will be brought to the Planning & Budget Committee and the Academic Board for approval, and to Governing Council for final approval. The Faculty of Arts and Science, through its established governance processes, has the authority to establish an EDU:A subject to required University approvals. Professors David Klausner and Frank Reid were present to answer questions. The Dean called on Vice-Dean Cowper to present the motion.
MOTION (duly moved and seconded)
THAT Graduate Education Council approve the proposal of the School of Graduate Studies that the Centre for Industrial Relations and Human Resources (EDU:A) be disestablished within the School of Graduate Studies and re-established as an EDU:A within the Faculty of Arts and Science, effective July 1, 2009, pending approvals.

As no discussion arose, the Dean called the question.

The motion was CARRIED.

9.2 Knowledge Media Design Institute
The Memorandum of Agreement between the Knowledge Media Design Institute and the Faculty of Information was distributed to members on yellow sheets at the beginning of today’s meeting. Graduate Education Council approval is final for the disestablishment of the Knowledge Media Design Institute as an EDU:C within SGS. The Faculty of Information, through its established governance processes, has the authority to establish an EDU:C. Professors Jens-Erik Mai and Ron Baecker were present to answer questions. The Dean called on Vice-Dean Cowper to present the motion.

MOTION (duly moved and seconded)
THAT Graduate Education Council approve the proposal of the School of Graduate Studies that the Knowledge Media Design Institute (EDU:C) be disestablished within the School of Graduate Studies and be re-established as an EDU:C within the Faculty of Information, effective July 1, 2009, pending approvals.

It was noted that, as Graduate Education Council approval was final, the phrase “pending approvals” in the motion was unnecessary.

Revised MOTION (duly moved and seconded)
THAT Graduate Education Council approve the proposal of the School of Graduate Studies that the Knowledge Media Design Institute (EDU:C) be disestablished within the School of Graduate Studies and be re-established as an EDU:C within the Faculty of Information, effective July 1, 2009.

Seeing no further questions, the Dean called the question.

The motion was CARRIED.

10 New Collaborative Program: Diaspora and Transnational Studies, Collaborative Master’s and Doctoral Program in,
The proposal was approved at the Faculty of Arts and Science Three Campus Graduate Curriculum Committee (3CGC) on April 15, 2009. At the 3CGC meeting it was asked why a new program was being created rather than adding a new field to an existing program. It was explained that it was necessary to create a new program because the only program which is similar is Ethnic and Pluralism Studies. However, that program focuses on the relationship
between nationalities within Canada; the new program in Diaspora and Transnational Studies will focus on transnationalism and how relations shape identities within Canada.

GEC approval is the final University of Toronto approval. It will be sent for information to the Academic Policy and Programs Committee of Academic Board in SGS’s annual report. The proposal will be submitted to OCGS for appraisal. Professor Ato Quayson was present to introduce the topic and answer questions. The Dean called on Vice-Dean Cowper to present the motion.

MOTION (duly moved and seconded)

THAT Graduate Education Council approve the proposal of the Faculty of Arts and Science for a new graduate Collaborative Master’s and Doctoral Program in Diaspora and Transnational Studies, to be housed within SGS Division I (Humanities) for administrative purposes, and with the Faculty of Arts and Science as the program’s lead Faculty, effective September 2009.

Professor Quayson explained that the new Collaborative Program derives from energies generated from an existing undergraduate program. Several students have enquired about continuing studies on the topic at the graduate level. There has also been a show of interest worldwide in the subject, demonstrating that there is an appetite for graduate training in this field. Diaspora and Transnational Studies (DTS) distinguish themselves from migration studies. Migration studies are heavily social-science oriented, and focus primarily on dynamics of settlement of peoples in, for example, the areas of public health concerns, labour market, etc. DTS, by contrast, focus on migrant groups and processes of translocalization. It is not enough to concern ourselves with what Somalians do to become integrated into Canadian society, but DTS focus is on how the dynamics of settlement allow people to become “translocal”. The distinction between the proposed program and the Ethnic and Pluralism Studies program is clear - the existing program belongs to the migration school with its focus on inter-ethnic relations, and it is exclusively social sciences-oriented. The existing program is also concerned with sub-national interests, such as Quebec and aboriginal studies. DTS is also be interested in ethnic relations, but Quebec issues, for example, but would not be a priority. The DTS combines humanities and social science perspectives. The third difference between DTS and Ethnic and Pluralism Studies is that DTS is inherently comparative. The core of the program is the quest for heritage; but Canada being a multi-cultural society, it is important to contrast and compare with experiences elsewhere.

Professor Quayson added that the Collaborative Program would have two core requirements:

(i) A comparative methods course to be delivered by at least two instructors from contrasting fields, with an integrated component that requires students to do a project which might involve ethnographic fieldwork and archival study or a documentary. Archival study might, for example, involve creating an annotated bibliography. Ethnographic fieldwork would involve the study of a community in a rigorous manner so as to get students to view their fieldwork in a comparative manner.

(ii) A second course with a thematic change every year. This might be a course on Jewish storytelling, or cosmopolitanism and literature, or Chinese business networks, all of which we are capable of delivering.

Professor Quayson concluded his introduction by noting that the Collaborative Program would be self-sustaining. No budget issues are anticipated for participating programs. The
program is expected to expand progressively on a seven-year plan. The ultimate objective is to make this the best centre of its kind in the world.

A member asked whether the Collaborative Program’s location in the humanities might pose a problem for students in the Social Sciences. Professor Quayson replied that locating the program in SGS Division I (Humanities) was a purely administrative matter and would not impact on the academic side of the program, including access by students registered in other SGS Divisions. The Dean noted that in theory, programs in any of the four Divisions could participate if interested, and that this was one of the strengths of the Collaborative Program mechanism.

A member asked if the required courses for the collaborative program would be in addition to a student’s home program requirements. Professor Quayson replied that this was not the case. A menu of courses pre-approved by the Collaborative Program Committee would be provided from offerings by the various participating programs. So students in the Collaborative Program would find that their required courses are already integrated in their home program. Any thesis project would have to be approved by the Collaborative Program Committee and need to have some bearing on DTS.

A member asked if students in the program would have access to the Collaborative Program’s courses if they were not registered in the Collaborative Program. Professor Quayson replied that this was not clear yet; the Collaborative Program will only offer two courses initially. He also noted that the proposed expansion in the number of participating programs would be facilitated by the fact that the mechanism for adding and removing participating programs was fairly smooth.

As there was no further discussion, the Dean called the question.

The motion was CARRIED.

11 Program Requirement Changes:

11.1 Cinema Studies, M.A.

The proposal was approved by the Cinema Studies Graduate Committee on February 2009. It was approved by the Faculty of Arts and Science Three Campus Graduate Curriculum Committee (3CGC) meeting on April 15, 2009; there was no substantive discussion at the meeting. GEC approval is final. It will be sent for information to the Academic Policy and Programs Committee of Academic Board in SGS’s annual report. The Dean called on Vice-Dean Cowper to present the motion.

MOTION (duly moved and seconded)

THAT Graduate Education Council approve the proposal of the Faculty of Arts and Science to change the program requirements of the M.A. in Cinema Studies program so the elective courses are no longer derived from “CIN1003H, CIN1539H, CIN6155H, CIN6156H, CIN6803H”, but from “elective CIN courses”, and that the list of elective courses is subject to change, effective September 2009.

No discussion arose; therefore the Dean called the question.

The motion was CARRIED.
11.2 Criminology, M.A., Ph.D.
The Graduate Coordinator consulted widely with graduate students and found broad support. The proposal was approved by the Centre of Criminology Faculty on January 14, 2009, and by the Committee on SGS Centres and Institutes on February 26, 2009. GEC approval is final. It will be sent for information to the Academic Policy and Programs Committee of Academic Board in SGS’s annual report. Professor Scot Wortley was present to answer questions. The Dean called on Vice-Dean Cowper to present the motion.

**MOTION (duly moved and seconded)**

THAT Graduate Education Council approve the proposal of the School of Graduate Studies to change the program requirements of the M.A. and Ph.D. in Criminology program to increase the number of courses that students may substitute from outside graduate units in lieu of optional courses in Criminology from 1.0 to 1.5 FCE. The overall number of elective courses required remains unchanged. This change is effective September 2009.

A member asked whether the motion ought to make the optional courses from outside the department subject to the approval of the Graduate Coordinator. Professor Wortley responded that this approval was actually required, and it would doubtless be a good idea to explicitly state this in the motion.

**Revised MOTION (duly moved and seconded)**

THAT Graduate Education Council approve the proposal of the School of Graduate Studies to change the program requirements of the M.A. and Ph.D. in Criminology program to increase from 1.0 to 1.5 FCE the number of courses that students may, with approval of the Graduate Coordinator, substitute from outside graduate units in lieu of optional courses in Criminology. The overall number of elective courses required remains unchanged. This change is effective September 2009.

Seeing no further discussion, the Dean called the question.

The motion was CARRIED.

11.3 European, Russian and Eurasian Studies (ERES), M.A.
This proposal was approved by the CERES Academic Committee. It was approved by the Faculty of Arts and Science Three Campus Graduate Curriculum Committee (3CGC) meeting on April 15, 2009; there was no substantive discussion at the meeting. GEC approval is final. It will be sent for information to the Academic Policy and Programs Committee of Academic Board in SGS’s annual report. Professor Robert Austin was present to answer questions. The Dean called on Vice-Dean Cowper to present the motion.

**MOTION (duly moved and seconded)**

THAT Graduate Education Council approve the proposal of the Faculty of Arts and Science to change the program requirements of the M.A. in European, Russian and Eurasian Studies program as follows:
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• to add ERE 2001H “Gateway Pro-Seminar to European, Russian and Eurasian Studies” as a required course, and

• to add the requirement of a 30 to 40 page master’s essay to the requirements of ERE 2000Y, which is already a required course.

Overall FCE requirements for the program are not changing. This change is effective September 2009.

A member asked why the master’s essay was being added as a requirement to ERE 2000Y. Professor Austin replied that the course had been offered for over ten years in this form, but this proposal makes it explicit and sets the length.

Another member asked if students currently enrolled in the course would be required to take the additional course. Professor Austin replied that the course already existed as an optional course, and that all students enrolled this year and last had taken it, since the Department strongly encouraged them to take it. No students currently enrolled in the program were expected to be affected by this change, only students enrolling in the Fall.

As there was no further discussion, the Dean called the question.

The motion was CARRIED.

11.4 Forest Conservation, M.F.C.

The proposal was approved by the Faculty of Forestry Graduate Education Committee on March 16, 2009. Dean C.T. Smith has approved the proposal on behalf of the Faculty of Forestry Council. GEC approval is final. It will be sent for information to the Academic Policy and Programs Committee of Academic Board in SGS’s annual report. Professor Paul Cooper was present to answer questions, if any. The Dean called on Vice-Dean Cowper to present the motion.

MOTION (duly moved and seconded)

THAT Graduate Education Council approve the proposal of the Faculty of Forestry to change the program requirements of the Master of Forest Conservation (M.F.C.) program to no longer require FOR3011H “International Forest Conservation Field Camp” but to instead require 0.5 FCE chosen from:

• FOR3011H “International Forest Conservation Field Camp”;

• FOR1585H “Urban Forest Conservation Field Camp”; or

• another eligible field course with the approval of the Graduate Coordinator, Faculty of Forestry, and subject to the requirements of the unit offering the course.

The overall number of required FCEs is not changing. This change is effective September 2009.

A member asked what the current thinking was about students needing fieldwork in this type of program. Professor Cooper replied that it was still felt to be necessary, but because the mandatory field camp was international, it did not always match with students’ interests and costs were significant. It was decided that the other field camps, which are located in North
America would also be suitable. This proposal does not remove field camp experience as a requirement.

There was no further discussion, therefore the Dean called the question.

The motion was CARRIED.

11.5 Management, Ph.D.

The proposal was approved by the Faculty’s Executive Committee at its November 14, 2008 meeting. It has been approved by Vice-Dean Peter Pauly on behalf of the Faculty of Management Council. GEC approval is final. It will be sent for information to the Academic Policy and Programs Committee of Academic Board in SGS’s annual report. Professor Alexander Dyck was present to answer questions, if any. The Dean called on Vice-Dean Cowper to present the motion.

MOTION (duly moved and seconded)
THAT Graduate Education Council approve the proposal of the Faculty of Management to change the program requirements of the Ph.D. in Management program to replace the existing breadth requirement with a new required full-year first-year course, MGT XXXXX “Research Methods in Business”, effective September 2009.

A member asked if adding this course changed the overall requirements. Professor Dyck replied that, viewed in light of recent students it would be a slight increase. The program had temporarily suspended its breadth requirements in 2005; viewed in light of the old breadth requirement, this proposal was actually a slight decrease in overall requirements.

The Dean asked if a course number would be provided soon for the new course. Professor Dyck replied in the affirmative.

There being no further discussion, the Dean called the question.

The motion was CARRIED.

11.6 Music Performance (Instrumental field), M.Mus.

The proposal was approved by the Faculty’s Executive Committee on February 10, 2009. GEC approval is final. It will be sent for information to the Academic Policy and Programs Committee of Academic Board in SGS’s annual report. Professor Gregory Johnston was present to answer questions. The Dean called on Vice-Dean Cowper to present the motion.

MOTION (duly moved and seconded)
THAT Graduate Education Council approve the proposal of the Faculty of Music to change the program requirements of the M.Mus. in Music Performance (Instrumental field only) by replacing the requirement that students complete 1.0 FCE chosen from a specified list approved by the department, students in brass, organ, percussion, strings and woodwinds be required to complete 1.0 FCE as two years of ensemble performance, while students in accordion, guitar, harp, and piano be required to complete 1.0 FCE elective courses from a specified list approved by the department. The overall number of required FCEs for both groups of students is not changing. This change is effective September 2009.
Professor Johnston noted that “organ” should be removed from the list of students being required to participate in ensemble performance, and that “harpsichord” and “organ” should be added to the list of students being required to take the elective course.

**Revised MOTION (duly moved and seconded)**

THAT Graduate Education Council approve the proposal of the Faculty of Music to change the program requirements of the MMus in Music Performance (Instrumental field only) by replacing the requirement that students complete 1.0 FCE chosen from a specified list approved by the department, students in brass, percussion, strings and woodwinds be required to complete 1.0 FCE as two years of ensemble performance, while students in accordion, guitar, harp, harpsichord, organ and piano be required to complete 1.0 FCE elective courses from a specified list approved by the department. The overall number of required FCEs for both groups of students is not changing. This change is effective September 2009.

The Dean asked if the Faculty Council had approved the proposal. Professor Johnston explained that it was part of the normal process for proposals from the Faculty of Music to receive approval from the Faculty’s Executive Committee before being brought to Graduate Education Council, and noted that the Dean of the Faculty chaired this committee.

A member asked for the rationale for the two lists. Professor Johnston explained that the Faculty was interested in encouraging all students to participate in larger ensembles, but this was not practical for the students in the second list.

Another member asked how the ensemble work would break down in terms of program requirements. Professor Johnston explained that each ensemble year would result in 0.5 credit for students, totaling 1.0 FCE for the two years of ensemble work. He added that the Faculty tried to be flexible about matching students with ensembles but that students were not guaranteed to get the ensemble they wanted.

Seeing no further discussion, the Dean called the question.

The motion was CARRIED.

12 **Other Business**

There was no other business.

13 **For Information:**

13.1 **Admissions and Programs Committee: Annual Report 2007-08**

The Dean drew members’ attention to the A&P Committee’s annual report which was distributed to members with the agenda. A very significant item, it illustrates the special considerations and decisions made outside SGS normal practice. She expressed her hope that members would agree that the committee is operating in an appropriate manner.

13.2 **Audit of Student Files 2008-09: Report**

The Dean brought to members’ attention the SGS Audit of Student Files report which was distributed to members with the agenda. She noted the University’s distinctively decentralized approach to official student records. As a result it is very important that every department
have good file management practices and that all documents be in order for every student. Thus every year SGS officers spend a great deal of time reviewing a set of files. The report describes the nature of errors and proportion found. SGS communicates with Departments on best practices. The process is part of SGS efforts to maintain order with student files. The diligent and careful work of Student Services officers in managing audits is appreciated.

13.3 Concurrent Registration Option (CRO): Guidelines
At its meeting of January 20, 2009, the SGS Graduate Education Council approved a new regulation for Concurrent Registration Option (CRO) at the master’s degree level effective September 2009. Guidelines for implementing the new regulation were distributed with the agenda and will be reported to the Office of the Provost for information. The guidelines are also posted on the SGS Policies & Guidelines webpage: http://www.sgs.utoronto.ca/governance/policies.htm

13.4 Dentistry, M.Sc., Ph.D.: Program Requirement Changes (Revised Motion)
A revised motion and Calendar entry were distributed with the agenda. The revised motion clarifies and more accurately reflects the proposal to change the program requirements for the Dentistry Program (M.Sc. and Ph.D.), Faculty of Dentistry, as approved at the GEC meeting on February 17, 2009. The original motion was also distributed with the agenda for reference. The Faculty of Dentistry has been extensively consulted in preparing the revised wording.

13.5 INC Grade: Guidelines
The guidelines distributed with the agenda clarify and guide the use of non grade notations, in particular INC. The guidelines are effective immediately. They will be reported to the Office of the University Registrar for information and are also posted on the SGS Policies & Guidelines webpage: http://www.sgs.utoronto.ca/governance/policies.htm

13.6 Time Limit for Completion of Program Requirements, Ph.D.: Regulation Change
An extract from the SGS Calendar was distributed with the agenda, detailing a minor change to SGS Degree Regulations. This change aligns the regulation wording with current practice and highlights the term “Candidacy” in the sub-heading. Dean Pfeiffer has approved the minor wording change on behalf of Council.

An extraneous instance of the words “up to” in the extract that was distributed with the agenda (just before the first insertion of “12 months”) was noted.

14 Adjournment
The meeting adjourned at 4:35 p.m.

__________________________  _________________________
Jane Alderdice, Secretary Date
Appendix to the Minutes

UNIVERSITY OF TORONTO
Record of Attendance
GRADUATE EDUCATION COUNCIL
Tuesday, April 21, 2009

Present (Voting & Non-voting Members)

Pfeiffer, Susan (Chair)
Abrams, Peter
Choi, Diana
Cowper, Elizabeth
Damaren, Chris
Davis, Karen
Goring, Daphne
Graham, Ian
Grenier, Jason
Johnston, Gregory
Klinger, Christopher
Liu, Hugh
Mai, Jens-Erik
Makarovska, Vesna
McKenzie, Christine
Mulongo, Joseph
Parizeau, Katherine
Radmacher, Kimberley
Roach, Lisa
Smith, Berry
Surendra, Harinee
Sztainbok, Iliana
Williams, David
Wilson, Adele

In Attendance (Guests & SGS Staff)

Austin, Robert
Baecker, Ron
Cooper, Paul
Dyck, Alexander
Godwin, Michael
Klausner, David
Quayson, Ato
Reid, Frank
Rutchinski, Steve
Wortley, Scot

Absent

Brubaker, Marcus
Cozea, Angela
Elliott, Robin
Hirst, Graeme
Julian, Stephen
Kooy, Mary
Moore, Carol
Tannock, Rosemary
Weedmark, Julie

Alderdice, Jane (Secretary to Council)
Purandaré, Anil (Assistant to Secretary)
MOTION
Graduate Education Council
Tuesday, May 19, 2009

ITEM 6

Proposal to approve appointments to the Graduate Academic Appeals Board (GAAB) for the 2009-2010 academic year:

MOTION
That Graduate Education Council approve the appointments of a Chair, Alternate Chair, two faculty and three student members to serve on the Graduate Academic Appeals Board for the 2009-2010 academic year as follows:

Chair: Ralph Scane, Faculty of Law (renewed)
Alternate Chair: Lorne Sossin, Faculty of Law (renewed)

Faculty Members:
(Three year term)
Russell Kazal, Division I
Luigi Girolametto, Division II

Student Members:
(One year term)
Jason Grenier, Division III
Behnam Nowrouzi-Kia, Division IV
Kimberley Radmacher, Division I

About Graduate Academic Appeals Board (GAAB):
The Graduate Academic Appeals Board (GAAB) is a standing committee of Graduate Education Council (GEC). Appointment of the Chair of GAAB is approved by GEC upon the nomination of the Dean of SGS. Appointment of faculty members is approved by GEC upon the nomination of the Vice-Dean, Students and the recommendation of the Committee on Student Matters. Appointment of student members is approved by GEC upon the nomination and election by the student members of GEC.

GAAB Membership 2009-2010:
If the motion above is approved, membership of GAAB for 2009-2010 will be as follows:

Chair: Ralph Scane, Faculty of Law (July 1, 2009 to June 30, 2010)
Alternate: Lorne Sossin (July 1, 2009 to June 30, 2012)

Division I Faculty Members
Members: Juvenal Ndayiragije, French Language and Literature (July 1, 2008 to June 30, 2011)
Greig Henderson, English (July 1, 2008 to June 30, 2011)
Russell Kazal, History (July 1, 2009 to June 30, 2012)
**Division II Faculty Members**

**Members:** Michele Peterson-Badali, Human Development & Applied Psychology *(July 1, 2007 to June 30, 2010)*
  Lynne Howarth, Information Studies *(July 1, 2008 to June 30, 2011)*
  Sandy Welsh *(July 1, 2008 to June 30, 2011)*

**Division III Faculty Members**

**Members:** Eric Hehner, Computer Science *(July 1, 2007 to June 30, 2010)*
  Chris Damaren, Chemistry *(July 1, 2008 to June 30, 2011)*
  Jane Phillips, Chemical Eng. & Applied Chemistry *(July 1, 2005 to June 30, 2011)*

**Division IV Faculty Members**

**Members:** Luigi Girolametto, Speech-Language Pathology *(July 1, 2009 to June 30, 2012)*
  Gary Sprules, Ecology and Evolutionary Biology *(July 1, 2007 to June 30, 2010)*
  Michael J. Wiley, Anatomy *(July 1, 2007 to June 30, 2010)*

**Student Members**

**Members:** Jason Grenier, Division III *(July 1, 2009 to June 30, 2010)*
  Behnam Nowrouzi-Kia, Division IV *(July 1, 2009 to June 30, 2010)*
  Kimberley Radmacher, Division I *(July 1, 2009 to June 30, 2010)*
MOTION
Graduate Education Council
Tuesday, May 19, 2009

ITEM 7

Proposal for the following new degree program:
Master of Science in Applied Computing, MScAC
Department of Computer Science, Faculty of Arts and Science

MOTION
THAT Graduate Education Council approve the proposal of the Faculty of Arts and Science, Department of Computer Science, for Master of Science in Applied Computing program leading to a Master of Science in Applied Computing (MScAC) degree, effective September 2010.

See attached documents:
• Governance Form E
• U of T Submission document
• OCGS Brief, Vol. 1
• Calendar Entry

Prior Approvals and Discussion

A professional masters committee was established within the Department of Computer Science which authorized a survey and prepared presentations at various faculty meetings; graduate student representatives were in attendance. The proposal was specifically discussed as an agenda item at faculty meetings of the Department on November 2, 2006, February 8, 2007, and March 6, 2008. These discussions shaped the committee’s final report. On December 4, 2008 the department voted in favour of proceeding with the proposal.

The proposal was approved by the Faculty of Arts and Science Three Campus Graduate Curriculum Committee (3CGC) on April 15, 2009. No substantive discussion arose at the 3CGC meeting.

Further Governance

If approved by GEC, the proposal will be brought to the Academic Policy and Programs Committee, the Planning and Budget Committee, and the Academic Board of Governing Council for approval, and to Governing Council for final University of Toronto approval. The proposal will be submitted to OCGS for a standard appraisal.
Name of Proposed Graduate Program:
Master of Science in Applied Computing (M.Sc.AC)

Faculty Affiliation:
The Faculty of Arts and Science

Name of Graduate Unit involved, if any:
Department of Computer Science

Brief Summary of Proposal:
This proposal for a Master of Science in Applied Computing (MSAC) program in the Department of Computer Science (DCS) is essential for accelerating the uptake of novel research in computing and related disciplines in Toronto and across Canada. These new ideas require a graduate-level education to understand, implement, and move forward, so this professionally-oriented master's program will give future innovators an active role in ongoing developments.

Prior Approvals/Actions:
The department has been considering the establishment of a professional master program for over two years. A professional masters committee was established and continues to this date; its members include the acting chair Sven Dickinson, former chairs Allan Borodin and Derek Corneil, and Professors Ravin Balakrishnan and Greg Wilson. The committee authorized the Impact Consulting survey and prepared oral/computer presentations at various faculty meetings, which were attended by graduate student representatives. The professional masters program was specifically discussed as an agenda item at faculty meetings on November 2, 2006, February 8, 2007, March 6, 2008 and December 4, 2008. Discussions at these meetings helped to shape the final report to the committee on December 4, 2008 at which time the department voted enthusiastically in favour of proceeding with a proposal to SGS and OCGS.

Proposed Effective Date:
September 2010

Date: March 2009

Submitted by:
Robert Baker, Vice Dean Graduate Education and Research
Faculty of Arts and Science

Contact information:
Professor Sven Dickinson, Acting Chair
Department of Computer Science
UNIVERSITY OF TORONTO

Proposal for a Graduate Program

Master of Science
in
Applied Computing Program (M.Sc.A.C.)

In

Department of Computer Science

March 2009
1 Executive Summary

The Department of Computer Science (DCS) proposes the creation of a new Master of Science in Applied Computing (M.Sc.A.C.) degree program in order to provide an outstanding professional education to train the next generation of technical leaders, innovators, and entrepreneurs. The program is intended for students with a strong undergraduate degree in Computer Science or a related discipline who want to expand their academic competence, but do not intend to pursue careers in research. Its most distinctive features are:
The Department of Computer Science proposes the creation of a new Master of Science in Applied Computing (M.Sc.A.C.) in order to provide an outstanding professional education to train the next generation of technical leaders, innovators,
and entrepreneurs.

The M.Sc.A.C. will be a 7.0 FCE, 16-month professional master’s program comprising two terms of coursework and a compulsory 8-month term industrial internship. The program is distinctive in several respects:

- Through the strong research leadership and mentorship of experienced DCS faculty, the program will establish a cadre of highly-qualified personnel able to act as a conduit between researchers and industrial practitioners. Both during their internship and afterward, M.Sc.A.C. students will take novel research ideas out of the lab and put them into practice, and bring new techniques and problems from industry back into a university setting to broaden and accelerate faculty members' research programs.

- The program will also equip graduates with a solid understanding of fundamental concepts in business and technical communication that are relevant to the technical leadership roles they will take on. As discussion with current and potential partners has made clear, it is often difficult for personnel with a pure research focus to explain why a new idea is important, or what benefits a new technique might bring, in terms that are relevant to industrial practitioners. One of the central goals of the M.Sc.A.C. is to create people capable of bridging this divide.

- Finally, the M.Sc.A.C. program will provide a natural way for highly-qualified personnel outside academia to transfer their expertise to the university through teaching, guest lectures, and mentorship or co-mentorship of interns.

2.1.2 Rationale for proposal

The applications of computer science continue to revolutionize the way we do business, learn, care for the sick, and entertain ourselves. The past decade alone has seen new ideas move from academia to industry in machine learning (predicting purchase preferences for online retailers), computer graphics (special effects in Hollywood blockbusters), clustered computing (computing-on-demand services for data processing), user interfaces (gesture-based interfaces for handheld devices), program analysis (proving the properties of safety-critical software for power plants and railways), and many other areas. Understanding these ideas and translating them into practical applications requires graduate-level training in the content of relevant research areas, but not necessarily research skills: a solid understanding of business fundamentals and the ability to communicate new ideas clearly and convincingly are equally essential.

The graduate program in the Department of Computer Science (DCS) at the University of Toronto (UT) is universally recognized as one of the strongest in the world. Its primary aim is, and will continue to be, to prepare students to conduct novel research. We therefore propose implementing a complementary program that will give future innovators the analytical, critical, scholarly, professional, and communication skills they need to play an active role in ongoing developments. As a unique program in a jurisdiction of high demand and little competition, we expect to initially attract interest primarily from Ontario residents, but also look forward to drawing students from across the country and overseas. Ontario-based companies of all sizes have voiced their desire for a program of this kind, as have hundreds of
potential applicants from all across Canada. Meeting this demand by training highly-qualified personnel to turn theory into practice will accelerate economic growth and help Canadian industry remain competitive in an increasingly globalized environment.

The OCGS consultants who reviewed the existing graduate program in 2007 strongly supported the idea of a professional master’s program. Creating a professionally-oriented graduate degree will also strengthen DCS’s ties with industry, which will in turn strengthen the department’s research programs. Existing collaborations with IBM, Bell, and other companies have proved extremely beneficial to all involved. However, the department has to date had less contact with the smaller, but equally innovative, companies that have made Toronto the third largest IT hub in North America. Programs like the University’s Professional Experience Year (PEY) have demonstrated that companies are eager for such contacts, and peer institutions such as Stanford, Washington, and Waterloo have been able to translate their ties into funding opportunities, graduate student internships, and new research partnerships and directions.

Much has been written on educational preparation of advanced practitioners in computing-oriented disciplines. Generally speaking, graduate level education distinguishes itself as providing “a depth in understanding, knowledge, scholarly competence, inquiry and discovery” that is “distinctly different from that at the undergraduate level”. It has been characterized as “advanced, focused and scholarly in nature”. Graduate education encourages students not only to critically analyze information presented to them, but also to challenge the underlying tenets of this information, so that they may improve practices as well as apply them. Graduates of such programs are “expected to acquire and apply advanced analytical and interpretative skills” in order to contribute to their disciplines, to educate and transmit knowledge within their domains, to systematically investigate timely questions and produce new knowledge or ways of thinking about their profession, to translate new knowledge to their everyday practice and ultimately extend the services they provide within their discipline and perhaps beyond. It is the enquiry, transformation, and innovation in practice that differentiates recipients of graduate-level education from colleagues with undergraduate-level education.

We believe that the graduates of the program we propose will harness their understanding of fundamental concepts in computer science to act as thought leaders, serving as a conduit to transfer ideas between those most interested in what is new and those most interested in what is useful. There are currently no graduate-level educational opportunities in Ontario of the kind we envision.

Further afield, many American schools complement their Ph.D. programs with terminal master’s programs, or offer coursework-only graduate degrees, without explicitly labeling them “professional”. The University of Washington’s Professional Master’s Program (http://pmp.cs.washington.edu/) is typical: it bills itself as “an evening/distance program” for fully-employed professionals in Washington State’s computing industry”. The program takes 50 students a year, most of whom study part-time or attend classes electronically. Students must complete eight courses drawn from a subset of the courses offered to research-oriented students, which includes “Software Entrepreneurship” and “Business Basics for CS Professionals”. Students must also earn a few additional credits by taking part in colloquia; the expected time to completion is two and a half years. The program has strengthened ties between the University of Washington and local giants such as Microsoft and
Boeing. This in turn led to donations, consulting opportunities, and increased undergraduate hiring by these companies. It also provided additional TA support for graduate students, and a small number of professional masters students became full-time research graduate students.

The University of Chicago’s Computer Science Professional Program (http://masters.cs.uchicago.edu/) is similar: courses drawn from the regular curriculum are offered in the evening so that people working full-time in the Greater Chicago area can continue their education at the graduate level. The program was originally designed to create technology managers and strategists, but over the years the scope of the program has expanded to accommodate students interested in pursuing other computing endeavors.

Finally, Stanford University’s Master’s Degree in Computer Science (http://cs.stanford.edu/degrees/mscs/) is “…meant to show prospective employers that you have a solid, broad understanding of computer science courses.” The program structure is rather complicated, but its emphasis on depth distinguishes it from others of its kind: students must complete 21 of 45 units in one of Artificial Intelligence, Biocomputation, Security, HCI, Numerical Analysis, Real-World Computing (which in practice often means computer graphics), Systems, Theoretical Computer Science, or Software Theory (which admits it is a “slightly more applied” version of Theoretical CS). There is good support for distance learning, and some students are able to cover their costs through research assistantships and other on-campus employment.

2.2 Pedagogical and other academic issues, including expected benefits of the proposed program

Through the strong research leadership and mentorship of experienced DCS faculty, the program will establish a cadre of highly-qualified personnel able to act as a conduit between researchers and industrial practitioners. Both during their internship and afterward, M.Sc.A.C. students will take novel research ideas out of the lab and put them into practice, and bring new techniques and problems from industry back into a university setting to broaden and accelerate faculty members' research programs. In the long term, the M.Sc.A.C. program will benefit DCS by creating more receptive partners for joint academic/industrial research projects. As government funding shifts in this direction, it is strategically important for the department, and indeed the university as a whole, to increase the number of potential collaborators who understand what pure research entails, why it is important, and how to reconcile the sometimes divergent aims of various stakeholders. Other leading computer science departments, such as Stanford and MIT, have a long history of “seeding” graduates in this way, with significant long-term payoff.

At the same time, between one third and one half of the department's graduate students leave for careers in industry after completing their M.Sc.. Many of these students never intended to pursue research careers, but undertook graduate study as a way to learn more about advanced topics in computer science. These students are not always well served by a program designed primarily for students who intend to go on to a Ph.D.; as the market survey described in Section 2.3 shows, many would find the M.Sc.A.C. more appealing. The M.Sc.A.C. program will also benefit graduate students in the research stream by creating more opportunities for internships and industrial scholarships. At present, only a minority of companies in Ontario recognize
the long-term value of having graduate students pursue their research on site. Exposure to applied research and technology transfer through the hosting of M.Sc.A.C. interns will serve as a step in this direction. Existing faculty will participate in this program, in the roles of teacher, mentor and supervisor. Faculty, as usual, will negotiate teaching commitments each year as part of their overall responsibilities. Comparing anticipated enrolment (a maximum of 24 new students per year) to existing graduate enrolment (approximately 60 new students per year), we expect that the impact of M.Sc.A.C. students on teaching workload and the content of existing graduate courses will be manageable.

2.3 Projected student demand

The impetus to create a program like the M.Sc.A.C. came from discussion among faculty about how well the department’s existing graduate programs were meeting students’ needs. While the exact numbers vary from year to year, a significant proportion of the department’s M.Sc. students choose not to pursue a Ph.D.. Many of these students feel that the department’s strong focus on original research, with publication as a primary goal, is not appropriate to their needs: while it was important to them to acquire advanced training and exposure to leading-edge concepts in their specialties, many would prefer to allocate the time required to prepare a thesis to a more practical demonstration of their knowledge and capabilities.

At the same time, discussions with existing industrial partners highlighted the fact that the most effective way to transfer technology from academia to industry is to transfer highly-qualified personnel. The possibility of opening up a higher-yield recruiting channel is very attractive to them: many companies already make extensive use of undergraduate interns, and were excited at the prospect of having graduate-level equivalents to choose from people, who could not only push forward the company’s existing agenda, but also bring in new ideas and show both how they could be of benefit, and how to implement them in practice. They also saw a professional program as a way to forge new and stronger ties with research faculty, as the program would avoid the tension that sometimes arises between a research graduate student’s need to produce publishable results, and industry’s desire for solutions to immediate real-world needs.

The OCGS consultants who reviewed our graduate program in 2007 also strongly supported the idea of a professional master’s program. DCS therefore commissioned Impact Consulting Group in the fall of 2007 to conduct market research on the feasibility of the M.Sc.A.C.. Impact designed a market survey and distributed it online early in 2008 to undergraduates and alumni from the University of Toronto, Waterloo, McGill, the University of Alberta, the University of Western Ontario, Queen’s, York, Ryerson, the University of Calgary, and the University of Saskatchewan. The survey included demographic questions, probes on respondents’ interest in the M.Sc.A.C., and a conjoint analysis to determine the relative importance of several program elements (see Appendix I).

There were a total of 1014 usable responses from Canadians and Landed Immigrants (LIs), and 100 from foreigners. Domestic respondents between the ages of 19 and 30 made up 65% of the sample and 75% of those who expressed an interest in the program. The interested respondents were primarily current undergraduate students or recent graduates now in the workforce. Roughly three-quarters of the sample had computer science backgrounds; over 50% had GPAs above 3.3 and there was no significant variation in interest based on GPA. The
program generated stable proportions of interest across respondents of all academic backgrounds except for Business, which had a significantly lower level of interest. As expected, respondents with Master’s degrees and Ph.D.’s were not as interested in the program.

There was a negative correlation between income and interest. The lower the current income reported by respondents, the more likely they were to be interested in the program. Interest level did not seem to vary across academic majors. Software Developer was the most common current vocation (43.3% of respondents), and Software Engineering was the preferred area of specialization (17.8%). However, there was a fair amount of response diversity in area of specialization and 12% of the sample was not prepared to choose at the time. There was a varied range of five-year career goals, but the most popular were entrepreneurial, working for a large company, and software development, in that order.

Based on this survey, it is possible to make a rough estimate of the number of qualified applicants the M.Sc.A.C. would attract from a target demographic made up of recent domestic graduates with industry experience and strong academic credentials:

<table>
<thead>
<tr>
<th>Number of students in Canadian CS undergrad programs 2000-07</th>
<th>7500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of those who are Canadian or Landed Immigrants</td>
<td>80%</td>
</tr>
<tr>
<td>Proportion of those likely to be interested in the program</td>
<td>40%</td>
</tr>
<tr>
<td>Proportion of those with GPAs above 3.7</td>
<td>30%</td>
</tr>
<tr>
<td>Estimated uptake rate</td>
<td>10%</td>
</tr>
<tr>
<td>Estimated number of potential applicants per year</td>
<td>72</td>
</tr>
</tbody>
</table>

Other key conclusions from the market survey are:

1. Since the M.Sc.A.C. is a fairly new kind of program, external promotion will be needed to raise awareness, understanding and interest. Marketing materials must emphasize the specific benefits of the program and DCS’s ability to deliver them.

2. An internship is a critical factor that will dictate the success of the M.Sc.A.C.. It consistently ranked as more important than skills or timetabling in every demographic, and is the key differentiator between the M.Sc.A.C. and the existing research-oriented M.Sc.. The data suggests that an internship with an open source organization is most preferred, followed by an internship with a large company. We hypothesize that this is because candidates are looking for brand-name internships that will enhance their resumes and increase their earning potential, and does not reflect any intrinsic aversion to working with smaller or younger companies.

3. The M.Sc.A.C. should initially be priced in a lower range than established professional programs such as MBAs: Impact Consulting suggested $8–12,000 for Canadians and $10–13,000 for international students. The price can and should be raised when there is an established value proposition that is corroborated by both alumni and employers.

4. There was no definitive preference for scheduling. Canadian respondents
generally preferred evening and weekend courses, but the target demographic and foreign respondents preferred full-time scheduling. We believe the latter is the best option for three reasons:
(a) The majority of those interested in the program were completing their undergraduate studies and were not yet employed.
(b) A full-time program would disrupt course scheduling and faculty research time much less than evening/weekend scheduling.
(c) Full-time students’ completion rates are significantly higher than those of part-time students.

5. Canadians in all categories want business skills to be included in the M.Sc.A.C.. The M.Sc.A.C. addresses this by requiring students to take two business-oriented courses as part of their program (CSC2701 and CSC2702), which are described in the two copies of Governance Form C that accompany this proposal.

To complement this survey, twelve software companies in the Greater Toronto Area were contacted by phone in late May and early June 2008 in order to determine industrial interest in the internship component of the proposed program. Ten of these companies were very enthusiastic, and would be: most interested in genuinely novel or exploratory projects; be flexible on intellectual property issues; pay a salary equivalent to or higher than what they pay undergraduate interns. Some stated that they would primarily be interested in using the program for recruiting purposes (i.e., as an extended job interview); several also stated that communication skills would be as valuable as business skills, if not more so, as interns would have to promote their work. Only two of the companies were equivocal: one is technologically very conservative, and felt there would not be a role internally for graduate-level interns, while the other company (one of the largest IT companies in the world) was concerned that the bureaucratic overhead of setting up something of this kind would outweigh the benefits.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>PROJECTED INTAKE AND ENROLMENTS</th>
<th>Masters (M) Program</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FULL-TIME</td>
<td>TOTAL ENROLMENT</td>
</tr>
<tr>
<td></td>
<td>Intake M</td>
<td>Enrolments M</td>
</tr>
<tr>
<td>2010-11</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>2011-12</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>2012-13</td>
<td>24</td>
<td>29</td>
</tr>
</tbody>
</table>
2.4 Impact on the Department’s and Division’s program of study, including impact on other divisions

This program fits well within DCS, as it is the natural home for computing-related research and teaching in the Faculty of Arts & Science and plays a leading role in graduate-level training of computing professionals in Canada. DCS has a long history of interdisciplinary research with departments from several faculties and local hospitals, and so will naturally be receptive to new ideas brought in from industry by M.Sc.A.C. students.

We expect that these will positively impact the work of the department's academically-focused graduate students and their faculty supervisors.

2.5 Evidence of consultation with other affected divisions

During the past two years, DCS has discussed this proposal at several levels with faculty from related academic units, such as Electrical & Computer Engineering, Business, Information Studies, Mathematics. The response was uniformly positive, and letters of support from these groups and others are attached in Appendix II. The proposal has also been discussed with the administrators of the Professional Experience Year program, who are also enthusiastic about prospects for collaboration.

2.6 Appropriateness of the name and designation of the new program

This new M.Sc.A.C. program is intended to produce graduate-level computer science practitioners, rather than researchers. The use of this degree name, M.Sc.A.C., signifies the course- and internship-based nature of the program and clearly distinguishes it from the existing research-based M.Sc. provided by DCS.

2.7 Program description and requirements, course titles/numbers, and faculty members

2.7.1 Program description and requirements

- Admission requirements

The general regulations of the School of Graduate Studies will govern the admissions process for the M.Sc.A.C.. Applicants to this program must have completed a recognized 4-year BSc in Computer Science or its equivalent (e.g., an undergraduate degree in Electrical Engineering or Software Engineering); have obtained a minimum GPA of B+ (77–79%) over their final two years of (full-time) undergraduate studies;
arrange for three letters of support from faculty and/or employers familiar with their work; and provide a statement of purpose.

- Program requirements

The Master of Science in Applied Computing is a 7.0 FCE program composed of 3.5 FCE of required courses including 2.5 FCE of general DCS graduate courses, 1.0 FCE of program-specific graduate courses described in Section 6, and successful completion of a two-term (eight-month) full-time industrial internship worth 3.5 FCE. To ensure cohesion within each cohort, and to facilitate informal ongoing progress monitoring, one of the two new courses created specifically for this program will be put on as an evening course during the eight-month internship. To meet the needs of both the M.Sc.A.C. and research programs, the department is in the process of defining foundational courses that will provide a broad overview of the core areas of computer science. Students may include up to 1.0 FCE of elective courses from related departments with the prior approval of the Program Director. There is no thesis requirement.

The M.Sc.A.C. will not initially have an explicit breadth requirement. Rather, the department will identify a range of “foundational courses” which will provide the necessary background for a subject area and then proceed to bring students to the current state of knowledge and practice in the area. Foundational courses will also identify the state of some current research so that students will then be prepared for more advanced courses and related internships. While we envision a range of backgrounds and undergraduate preparation, normally we would expect MACS students to take between 2 and 4 foundational courses and at least one advanced course. Course selection for each individual student will be approved by the Program Director.

The M.Sc.A.C. industrial internship is what distinguishes this program from the department’s research M.Sc. and other graduate-level programs in Canada. Students spend the second eight months of the program in a full-time internship sited at a local company, non-profit, or open source organization. The focus is technology transfer: students must take a novel idea from computer science research and translate those ideas into insightful models and analysis and/or commercial-quality software in order to demonstrate mastery of both the intellectual domain and professional practices.

DCS will facilitate matching M.Sc.A.C. students with host companies, and students will negotiate salaries with those companies on a case-by-case basis. All of the companies contacted in the spring and summer of 2008 stated that they would expect to pay M.Sc.A.C. interns at the same rate as, or higher than, undergraduate PEY and co-op students (currently $36-$45K, or roughly two thirds to three quarters of a junior developer’s salary). Discussions with Mathematics and Information Technology and Complex Systems (MITACS) indicate that many internships should qualify for partial funding under the MITACS ACCELERATE CANADA program, which would offset half of the employers’ costs, and thereby make interns even more attractive. Should a suitable paid placement not be found the department will arrange an equivalent unpaid placement with an open source organization or non-profit organization.

Intellectual property rights will also be negotiated on a case-by-case basis with the involvement of the M.Sc.A.C. Program Director or an appointed alternate. The university will provide a small number of templates to use as starting points for these
discussions; these will be reviewed and updated on an annual basis. As with
internships, DCS will take the lead in coordinating these arrangements. All of the
companies contacted in the spring and summer of 2008 understood that interns
would need to be able to discuss their work publicly in order to be evaluated, and
believed that equitable arrangements could easily be reached.

The program’s support for establishing and maintaining industrial partners for
internships is key to attracting students. Students will not only gain practical
experience in technology transfer, but will also have access to well-trained
professional support staff in their host company to help realize their vision and make
further connections in industry. Our market survey and other research have
demonstrated that potential applicants and company partners will value this
opportunity highly.

The Program Director will play an active role in coordinating internships. Each project
will be monitored by a faculty sponsor, a representative from the host company, and
the M.Sc.A.C. Program Director or an appointed alternate. Students will be required
to report progress three times during their internship (mid-summer, September, and
late October), and to present the final results of their work at the end of the
internship. Internships will be evaluated on a CR/NCR basis.

2.7.2 Course titles/numbers

New courses developed specifically for this program will be CSC2701 and CSC2702,
which are described in the copies of Governance Form C attached to this proposal.

2.7.3 Faculty members

The M.Sc.A.C. program will draw on the established strength in computer science
among graduate faculty members at the University of Toronto. Leaders in all areas of
computer science, ranging from algorithm theory (where the university boasts
Canada’s only Turing Award winner) and machine learning to computer graphics,
software engineering, and more will all teach in the core of the program. The faculty
list will be broadened as the program evolves during its three-year ramp up phase to
ensure quality and choice to participants.

As of November 2008, the Department of Computer Science has 51 full-time faculty
members and 11 full-time lecturers across three campuses. 41 full-time faculty are cross-appointed to DCS from other departments, while another 13 hold adjunct appointments or have some other standing with SGS through their relationship with DCS. Should cross-appointed faculty wish to participate in this program, approval will be requested from the head of their home department.

All of these appointments have associated expectations related to teaching, mentoring and supervision. Specific teaching and administrative assignments are negotiated and agreed to each year as part of the overall department planning.

The faculty listed in Table 2 have all committed in principle to being actively involved with the program. All are first-rate teachers and researchers in their specialties, and have extensive experience in graduate mentoring through existing M.Sc./Ph.D. programs. Most are known internationally for the strength of their research, and many also have prior experience with technology transfer and joint industrial projects. Their high qualifications and wide range of knowledge and expertise will ensure an intellectually challenging learning environment.

### TABLE 2

<table>
<thead>
<tr>
<th>Faculty Name &amp; Rank</th>
<th>M/F</th>
<th>Home Unit</th>
<th>Supervisory Privileges</th>
<th>Fields²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacchus, Fahiem</td>
<td>M</td>
<td>CSC</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Baecker, Ron</td>
<td>M</td>
<td>CSC</td>
<td>F</td>
<td>1</td>
</tr>
<tr>
<td>Balakrishnan, Ravin</td>
<td>M</td>
<td>CSC</td>
<td>F</td>
<td>2</td>
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<tr>
<td>Borodin, Allan</td>
<td>M</td>
<td>CSC</td>
<td>F</td>
<td>3</td>
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<tr>
<td>Boutilier, Craig</td>
<td>M</td>
<td>CSC</td>
<td>F</td>
<td>4</td>
</tr>
<tr>
<td>Brudno, Michael</td>
<td>M</td>
<td>CSC</td>
<td>A</td>
<td>5</td>
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<td>10</td>
</tr>
</tbody>
</table>
3 Planning and Budget

3.1 Resource implications

The funding necessary to mount the M.Sc.A.C. program will come from tuition revenue and BIU income. There will therefore be no impact on departmental resources.

3.1.1 Staffing

This M.Sc.A.C. program will draw primarily upon existing DCS faculty who are already associated with graduate programs through their faculty appointments. Where instructors are brought in from industry, teaching stipends will be provided according to departmental policies. Such instructors will be appointed as associate members of graduate faculty; we expect they will primarily be used for the two new program-
specific courses (CSC2701 and CSC2702) described in the copies of Governance Form C attached to this proposal.

In addition, DCS will appoint a Program Director to administer the program. This will be a part-time position; we anticipate that the Program Director's primary responsibility will be to facilitate industrial internship projects, and that he or she will work closely with DCS's Associate Chair, Research and Industrial Relations. DCS will provide administrative support for this position with existing staff. As the program ramps up, we anticipate hiring a 50% FTE support staff position.

3.1.2 Space

M.Sc.A.C. students’ enrolment in existing graduate courses is not expected to require any significant changes in the space allocation for those courses, as the percentage increase is comparable to the year-on-year variation in normal enrolment. Lecture space will be found for the two new courses (CSC2701 and CSC2702). One or the other of these will be run as an evening course during the eight-month internship, which will make room scheduling somewhat easier. Faculty associated with the program will continue to work from the office/space already assigned to them. The Program Director will use her/his existing office for administrative purposes, as this position will not be a full-time responsibility.

During the M.Sc.A.C. program’s ramp-up period, students will be housed in existing graduate space during their eight months of classes. The full-time internship ensures that there will not be overlap on campus between cohorts. As numbers increase over the next three years to the projected steady state of 24 students, the department will reprovision space in the Sandford Fleming Building (SF4303 and SF4303F) to accommodate them. Funds required for this will be drawn from program fees.

3.1.3 Libraries

Library facilities at the University of Toronto are excellent—the University of Toronto Library system is one of the largest in North America and its holdings of computing-related materials are extensive. The university’s various libraries work together to facilitate resource sharing and to ensure that their resources, and the resources of local research hospitals, are easily accessible to users at any time. Electronic links exist to all major relevant archives, particularly those of the Association for Computing Machinery (ACM), the Institute of Electrical and Electronics Engineers (IEEE) and the Society for Industrial and Applied Mathematics (SIAM). The Library offers an on-line catalogue and links to 15,000 electronic journals, some 60% of which have the full text of their articles available. A summary statement by the Chief Librarian of the University of Toronto on holdings pertinent to the fields of study included in the M.Sc.A.C., the University’s collection policy, and expenditures is attached as Appendix III.

3.1.4 Computing facilities

All M.Sc.A.C. students will be provided with a standard University of Toronto account that will give them access to electronic mail facilities, the Internet, and a wide variety of tools and services. The University of Toronto Information Commons, Computer and Networking Services, Software Distribution Service, and Resource Centre on Academic Technology provide extensive computer support to students. All students in the M.Sc.A.C. are expected to have access to a home/office PC or laptop with
internet access, electronic mail, and general office software. M.Sc.A.C. students will also be provided with accounts giving them access to shared DCS teaching computing facilities, which include compute and database servers, and workstations that provide access to a wide array of software packages (such as Matlab), laser printers, and DCS wired and wireless networks.

In particular, this means that M.Sc.A.C. students will have access to the department’s collection of more than half a dozen shared teaching laboratories, each containing twelve to twenty-four workstations (approximately 150 in total). As this is only a moderate increase over current numbers, we expect no significant impact on our current programs. Further access to specialized facilities belonging to particular research groups (e.g. innovative user interface devices or high-performance computing clusters) will be determined on a course-by-course or project-by-project basis, taking into account the student’s need and the likely impact of their work on both the department’s and the research group’s interests.

In general, industrial project partners will be expected to provide facilities for internship students. However, industrial partners may be given some level of access to departmental or research group facilities on either a free or paid basis. Decisions regarding this will be made case-by-case by the Program Director in consultation with academic members of any affected research groups.

3.1.5 Enrolment/admissions

The program projects an initial intake of 6 full-time students, increasing to 12 in its second year and the targeted maximum of 24 per year students in its third. Note that the program will not have to deal with space issues arising from overlapping cohorts, as the students from one cohort will be off campus doing internships when their successors arrive (except for their one remaining course, which we expect will usually be run in the evenings).

3.1.6 Revenues/costs

A budget for the program is attached as Appendix IV. Note that, it is anticipated that all direct and indirect costs related to this program will be fully covered by student tuition and BUI revenues. This includes of teaching stipends for the two new courses being mounted in this program.

3.1.7 Financial aid

As the M.Sc.A.C. program is a professional master’s degree program, students are not part of the University’s funded graduate cohort. Funding may be available for scholarships and awards and to assist students with incidental fees. We do not anticipate any significant number of students receiving direct financial support from their employers. Any agreements students reach with previous employers regarding internship projects must be approved by the Program Director. See section 5.3 for further details.
4 Space and Facilities

4.1 Requirements for physical facilities

See Section 3.1.2.

4.2 Capital projects for approvals

None initially. DCS will revisit this issue in two years time as the program ramps up.

5 Students

5.1 Student affairs and services

Like students in our other graduate programs, M.Sc.A.C. students will be challenged by courses which will provide the motivation, scientific basis, and state of current knowledge in a wide variety of subject areas. These foundations will be complemented by research ideas that will move the field significantly beyond its current state. All of our courses require rigorous analysis; many also require students to demonstrate the ability to undertake successful implementations where appropriate through significant projects. Instructors make themselves available as much as possible for individual meetings; other than small seminar courses, most also have Ph.D. students assigned as teaching assistants who make themselves available for further discussion.

The graduate environment, however, is much more than course work. All graduate students are expected to attend seminars relevant to their interests as well as more general colloquia featuring distinguished international scholars. The department supports weekly seminars in all research areas featuring visiting scholars as well as seminars based on faculty research and student research. In particular, every research M.Sc. student continuing on to the Ph.D. program presents a seminar based on their research. Beyond these departmentally-organized seminars and colloquia, graduate students often run more informal seminars at which they present recent conference papers as well as give preliminary reports on their own work.

In order to ensure that M.Sc.A.C. students are fully engaged in these activities, they will be required to give a presentation near the end of their internship summarizing their experiences and the contributions they have made. Also, as discussed elsewhere, M.Sc.A.C. students will be enrolled in one of the two special business-oriented courses during their internship. Scheduling the course this way will facilitate discussions as to the progress of the internship and any issues that may arise. While we expect and will promote complete integration of all graduate students, it is expected that these two special courses and the commonality of an internship will foster additional cohesiveness amongst M.Sc.A.C. students.

Beyond the activities within the department, the University sponsors a wide variety of seminars and colloquia for all members of the University community as well as the general public. We frequently enjoy thought provoking presentations by Nobel Prize winners, internationally acclaimed artists and authors, and major political leaders.

5.2 Student conduct and discipline
Standard university guidelines and policies for student conduct will govern in the M.Sc.A.C. program. In addition, all UT policies and procedures governing professional students will be followed both while they are on campus full time and during their internships.

5.3 Financial Support

As discussed in Section 3.1, the M.Sc.A.C. program will be entirely self-funded: students will not generally be eligible for NSERC grants, Ontario Graduate Scholarships, or other research-oriented support. DCS may allow them access to departmental scholarships and similar funds administered at the department's discretion, provided they meet the criteria. See Section 2.7.1 for a discussion of salaries that M.Sc.A.C. students could reasonably expect during their internships.

5.4 Student registration and information systems

The general regulations and enrollment procedures of the School of Graduate Studies will apply to the students.
The University of Toronto

Brief for the Periodic/Standard Appraisal of the Master of Science in Applied Computing in Computer Science

Submitted to the Ontario Council on Graduate Studies March 2009

VOLUME I: The Program
THE PROGRAM

1. INTRODUCTION

1.1. Brief listing of programs

The Department of Computer Science proposes the creation of a new Master of Science in Applied Computing (M.SC.A.C.) in order to provide an outstanding professional education to train the next generation of technical leaders, innovators, and entrepreneurs.
The M.Sc.A.C. will be a 7.0 FCE, 16-month professional master's program comprising two terms of coursework and a compulsory 8-month term industrial internship. The program is distinctive in several respects:

- Through the strong research leadership and mentorship of experienced DCS faculty, the program will establish a cadre of highly-qualified personnel able to act as a conduit between researchers and industrial practitioners. Both during their internship and afterward, M.Sc.A.C. students will take novel research ideas out of the lab and put them into practice, and bring new techniques and problems from industry back into a university setting to broaden and accelerate faculty members’ research programs.

- The program will also equip graduates with a solid understanding of fundamental concepts in business and technical communication that are relevant to the technical leadership roles they will undertake. As discussion with current and potential partners has made clear, it is often difficult for personnel with a pure research focus to explain why a new idea is important, or what benefits a new technique might bring, in terms that are relevant to industrial practitioners. One of the central goals of the M.Sc.A.C. is to create people capable of bridging this divide.

- Finally, the M.Sc.A.C. program will provide a natural way for highly-qualified personnel outside academia to transfer their expertise to the university through teaching, guest lectures, and mentorship or co-mentorship of interns.

1.2. Objectives of the programs

The applications of computer science continue to revolutionize the way we do business, learn, care for the sick, and entertain ourselves. The past decade alone has seen new ideas move from academia to industry in machine learning (predicting purchase preferences for online retailers), computer graphics (special effects in Hollywood blockbusters), clustered computing (computing-on-demand services for data processing), user interfaces (gesture-based interfaces for handheld devices), program analysis (proving the properties of safety-critical software for power plants and railways), and many other areas. Understanding these ideas and translating them into practical applications requires graduate-level training in the content of relevant research areas, but not necessarily research skills: a solid understanding of business fundamentals and the ability to communicate new ideas clearly and convincingly are equally essential.

The graduate program in the Department of Computer Science (DCS) at the University of Toronto (UT) is universally recognized as one of the strongest in the world. Its primary aim is, and will continue to be, to prepare students to conduct novel research. We therefore propose implementing a complementary program that will give future innovators the analytical, critical, scholarly, professional, and communication skills they need to play an active role in ongoing developments. As a unique program in a jurisdiction of high demand and little competition, we expect to initially attract interest primarily from Ontario residents, but also look forward to drawing students from across the country and overseas. Ontario-based companies of all sizes have voiced their desire for a program of this kind, as have hundreds of potential applicants from all across Canada. Meeting this demand by training
highly-qualified personnel to turn theory into practice will accelerate economic growth and help Canadian industry remain competitive in an increasingly globalized environment.

The OCGS consultants who reviewed our graduate program in 2007 strongly supported the idea of a professional master's program. Creating a professionally-oriented graduate degree will also strengthen DCS's ties with industry, which will in turn strengthen the department's research programs. Existing collaborations with IBM, Bell, and other companies have proved extremely beneficial to all involved. However to date, the department has had less contact with the smaller, but equally innovative, companies that have made Toronto the third largest IT hub in North America. Programs like the University’s Professional Experience Year (PEY) have demonstrated that companies are eager for such contacts, and peer institutions such as Stanford, Washington, and Waterloo have been able to translate their ties into funding opportunities, graduate student internships, and new research partnerships and directions.

Much has been written on educational preparation of advanced practitioners in computing-oriented disciplines. Generally speaking, graduate level education distinguishes itself as providing “a depth in understanding, knowledge, scholarly competence, inquiry and discovery” that is “distinctly different from that at the undergraduate level”. It has been characterized as “advanced, focused and scholarly in nature”. Graduate education encourages students not only to critically analyze information presented to them, but also to challenge the underlying tenets of this information, so that they may improve practices as well as apply them. Graduates of such programs are “expected to acquire and apply advanced analytical and interpretative skills” in order to contribute to their disciplines, to educate and transmit knowledge within their domains, to systematically investigate timely questions and produce new knowledge or ways of thinking about their profession, to translate new knowledge to their everyday practice and ultimately extend the services they provide within their discipline and perhaps beyond. It is the enquiry, transformation, and innovation in practice that differentiates recipients of graduate-level education from colleagues with undergraduate-level education.

We believe that the graduates of the program we propose will harness their understanding of fundamental concepts in computer science to act as thought leaders, serving as a conduit to transfer ideas between those most interested in what is new and those most interested in what is useful. There are currently no graduate-level educational opportunities in Ontario of the kind we envision.

DCS is the ideal graduate unit for the proposed professional program, as it is the primary graduate unit for computing-related studies in the Faculty of Arts & Science and the University of Toronto as a whole. As of November 2008, DCS has 269 graduate students in its existing graduate programs (170 M.Sc., 99 Ph.D.). The M.Sc.A.C. students will integrate with this diverse student population and benefit from the many activities already in place in DCS.

1.3. Method used for the self-study as well as the preparation of the brief, including faculty and student input and involvement

The impetus to create a program like the M.Sc.A.C. initially came from discussion among faculty about how well the department's existing graduate programs were meeting
students’ needs. While the exact numbers vary from year to year, a significant proportion of the department’s M.Sc. students choose not to pursue a Ph.D.. Many of these students feel that the department’s strong focus on original research, with publication as a primary goal, is not appropriate to their needs: while it was important to them to acquire advanced training and exposure to leading-edge concepts in their specialties, many would prefer to allocate the time required to prepare a thesis to a larger practical demonstration of their knowledge and capabilities.

At the same time, discussions with existing industrial partners highlighted the fact that the most effective way to transfer technology from academia to industry is to transfer highly-qualified personnel. The possibility of opening up a higher-yield recruiting channel is very attractive to them: many companies already make extensive use of undergraduate interns, and were excited at the prospect of having graduate-level interns to choose from who could not only push forward the company’s existing agenda, but also bring in new ideas and show both how they could be of benefit, and how to implement them in practice. They also saw a professional program as a way to forge new and stronger ties with research faculty, as the program would avoid the tension that sometimes arises between a research graduate student’s need to produce publishable results, and industry’s desire for solutions to immediate real-world needs.

The OCGS consultants who reviewed our graduate program in 2007 also strongly supported the idea of a professional master's program. DCS therefore commissioned Impact Consulting Group in the fall of 2007 to conduct market research on the feasibility of the M.Sc.A.C.. Impact designed a market survey and distributed it online early in 2008 to undergraduates and alumni from the University of Toronto, Waterloo, McGill, the University of Alberta, the University of Western Ontario, Queen's, York, Ryerson, the University of Calgary, and the University of Saskatchewan. The survey included demographic questions, probes on respondents’ interest in the M.Sc.A.C., and a conjoint analysis to determine the relative importance of several program elements (see Appendix VI).

There were a total of 1014 usable responses from Canadians and Landed Immigrants (LIs), and 100 from foreigners. Domestic respondents between the ages of 19 and 30 made up 65% of the sample and 75% of those who expressed an interest in the program. The interested respondents were primarily current undergraduate students or recent graduates now in the workforce. Roughly three-quarters of the sample had computer science backgrounds; over 50% had GPAs above 3.3 and there was no significant variation in interest based on GPA. The program generated stable proportions of interest across respondents of all academic backgrounds except for Business, which had a significantly lower level of interest. Unsurprisingly, respondents with Master's degrees and Ph.D.’s were not as interested in the program.

There was a negative correlation between income and interest. The lower the current income reported by respondents, the more likely they were to be interested in the program. Interest level did not seem to vary across academic majors. Software Developer was the most common current vocation (43.3% of respondents), and Software Engineering was the preferred area of specialization (17.8%). However, there was a fair amount of response diversity in area of specialization and 12% of the sample was not prepared to choose at the time. There was a varied range of five-year career goals, but the most popular were entrepreneurial, working for a large company, and software development, in that order.
Based on this survey, it is possible to make a rough estimate of the number of qualified applicants the M.Sc.A.C. would attract from a target demographic made up of recent domestic graduates with industry experience and strong academic credentials:

<table>
<thead>
<tr>
<th>Number of students in Canadian CS undergrad programs 2000-07</th>
<th>7500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of those who are Canadian or Landed Immigrants</td>
<td>80%</td>
</tr>
<tr>
<td>Proportion of those likely to be interested in the program</td>
<td>40%</td>
</tr>
<tr>
<td>Proportion of those with GPAs above 3.7</td>
<td>30%</td>
</tr>
<tr>
<td>Estimated uptake rate</td>
<td>10%</td>
</tr>
<tr>
<td>Estimated number of potential applicants per year</td>
<td>72</td>
</tr>
</tbody>
</table>

Other key conclusions from the market survey are:

1. Since the M.Sc.A.C. is a fairly new kind of program, external promotion will be needed to raise awareness, understanding and interest. Marketing materials must emphasize the specific benefits of the program and DCS’s ability to deliver them.

2. An internship is a critical factor that will dictate the success of the M.Sc.A.C.. It consistently ranked as more important than skills or timetabling in every demographic, and is the key differentiator between the M.Sc.A.C. and the existing research-oriented M.Sc.. The data suggests that an internship with an open source organization is most preferred, followed by an internship with a large company. We hypothesize that this is because candidates are looking for brand-name internships that will enhance their resumes and increase their earning potential, and does not reflect any intrinsic aversion to working with smaller or younger companies.

3. The M.Sc.A.C. should initially be priced in a lower range than established professional programs such as MBAs: Impact Consulting suggested $8–12,000 for Canadians and $10–13,000 for international students. The price can and should be raised when there is an established value proposition that is corroborated by both alumni and employers.

4. There was no definitive preference for scheduling. Canadian respondents in general preferred evening and weekend courses, but the target demographic and foreign respondents preferred full-time scheduling. We believe the latter is the best option for three reasons:
   (a) The majority of those interested in the program were completing their undergraduate studies and were not yet employed.
   (b) A full-time program would disrupt course scheduling and faculty research time much less than evening/weekend scheduling.
   (c) Full-time students’ completion rates are significantly higher than those of part-time students.

5. Canadians in all categories want business skills to be included in the M.Sc.A.C.. The M.Sc.A.C. addresses this by requiring students to take two new business-oriented courses as part of their program (CSC2701 and CSC2702), which are
described in Section 4.4.

To complement this survey, twelve software companies in the Greater Toronto Area were contacted by phone in late May and early June 2008 in order to determine industrial interest in the internship component of the proposed program. Ten of these companies were very enthusiastic, and would be: most interested in genuinely novel or exploratory projects; flexible on intellectual property issues; pay a salary equivalent to or higher than what they pay undergraduate interns. Some stated that they would primarily be interested in using the program for recruiting purposes (i.e., as an extended job interview); several also stated that communication skills would be as valuable as business skills, if not more so, as interns would have to promote their work. Only two of the companies were equivocal: one is technologically very conservative, and felt there would not be a role internally for graduate-level interns, while the other company (one of the largest IT companies in the world) was concerned that the bureaucratic overhead of setting up something of this kind would outweigh the benefits.

1.4 Fields in the programs (indicate recent changes if any)

There are no new additional fields in this program.

1.5 Review concerns expressed in previous appraisal and actions taken

Not applicable (new proposal).

1.6 Special matters and innovative features

The M.Sc.A.C. is intended for students with a strong undergraduate degree in computer science or a related discipline who want to expand their academic competence, but do not intend to pursue careers in research. The program will consist of course work (both required and elective) and an eight-month faculty supervised industrial internship in which students will be required to demonstrate that they are able to translate some novel research idea into practice. There is no thesis requirement. This program directly addresses the strategic imperatives outlined in University of Toronto Vice-President Paul Young’s “Tri-Council Market Share Analysis and Strategy” report (September 2008) by fostering stronger and deeper ties between the DCS and local high-tech companies. As a unique program in a jurisdiction of high demand and little competition, we expect to initially attract interest primarily from Ontario residents, but also look forward to drawing students from across the country and overseas. The results of our market survey (see Appendix VI) clearly indicate strong demand for the program, both locally and nationally.

2. THE FACULTY

2.1 List of faculty by field

The M.Sc.A.C. program will draw on the established strength in computer science among graduate faculty members at the University of Toronto. Leaders in all fields of
computer science, ranging from algorithm theory (where the University of Toronto boasts Canada's only Turing Award winner) and machine learning to computer graphics, software engineering, and more will all teach in the core of the program. The faculty list will be broadened as the program evolves during its three-year ramp up phase to ensure quality and choice to participants.

As of November 2008, the Department of Computer Science has 51 full-time faculty members and 11 full-time lecturers across three campuses. 41 full-time faculty are cross-appointed to DCS from other departments, while another 13 hold adjunct appointments or have some other standing with SGS through their relationship with DCS. All of these appointments have associated expectations related to teaching, mentoring and supervision. Specific teaching and administrative assignments are negotiated and agreed to each year as part of the overall department planning.

The faculty listed in Table 1 have all committed to being actively involved with the program. From its inception we expect additional faculty will come on board as the program progresses. All are first-rate teachers and researchers in their specialties, and have extensive experience in graduate mentoring through existing M.Sc./Ph.D. programs. Most are known internationally for the strength of their research, and many also have prior experience with technology transfer and joint industrial projects. Their high qualifications and wide range of knowledge and expertise will ensure an intellectually challenging learning environment.
**TABLE 1**

**Faculty Members by Field**

<table>
<thead>
<tr>
<th>Faculty Name &amp; Rank</th>
<th>M/F</th>
<th>Home Unit</th>
<th>Supervisory Privileges$^1$</th>
<th>Fields$^2$</th>
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*Supervisory Privileges$^1$*  
F = Full Member  A = Associate Member

*Fields$^2$*  
Field 1  Computational Complexity  
Field 2  Applied Discrete Mathematics  
Field 3  Scientific and Numerical Computation  
Field 4  Artificial Intelligence  
Field 5  Database and Information Systems  
Field 6  Computer Graphics & Human-Computer Interaction  
Field 7  Computer systems: Hardware and Software  
Field 8  Programming Languages and Methodology  
Field 9  Software Engineering  
Field 10  Bioinformatics
2.2. External operating research funding

### TABLE 2

<table>
<thead>
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<th>Source</th>
<th>Year</th>
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<th>Other Peer Adjudicated</th>
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<th>Others</th>
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### TABLE 2a

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Fields:
- Field 1  Computational Complexity
- Field 2  Applied Discrete Mathematics
- Field 3  Scientific and Numerical Computation
- Field 4  Artificial Intelligence
- Field 5  Database and Information Systems
- Field 6  Computer Graphics and Human-Computer Interaction
- Field 7  Computer systems: Hardware and Software
- Field 8  Programming Languages and Methodology
- Field 9  Software Engineering
- Field 10  Bioinformatics
2.2. Graduate supervision

The list below reflects the excellence, breadth, and depth of faculty at the University of Toronto with teaching and research expertise relevant to the various elements of the M.Sc.A.C.. Notably, the list includes a number of tenure-track or recently tenured faculty members in addition to internationally renowned senior scholars. This mix of junior and senior faculty bodes well for the program's immediate viability and future growth.

### TABLE 3

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<th>Member</th>
<th>Completed</th>
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<td>Wilson, G.</td>
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</table>

*Category* 1 - Tenured or tenure-track core faculty members
2.3. Current teaching assignments

The M.Sc.A.C. program will require six half courses in the first eight months of the program, followed by a full-time eight-month internship, during which students will complete a seventh course. Five of the seven half courses will be drawn from the department’s existing graduate curriculum, and taught by existing faculty. These courses will give M.Sc.A.C. students direct contact with leading-edge researchers in a variety of fields, which will in turn facilitate the choice and implementation of internship projects.

The remaining two courses required by the M.Sc.A.C. will be new offerings devoted to topics of particular relevance to program participants. These will initially be taught by faculty with particular interest in the topics, faculty from other relevant departments, and/or adjunct faculty based in industry with particular expertise in the topic areas. In the latter two cases, the cost of instructors will be covered directly by program fees.

Table 4 lists undergraduate and graduate courses taught in the last three years by the faculty listed in Table I. We note that all faculty appointed to the graduate school will likely teach courses relevant to the M.Sc.A.C. program. We also note that some faculty listed in Table I have not taught courses in certain years due to administrative responsibilities and leaves of absence.
### TABLE 4

#### Teaching Assignment for 2006/2007

<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>Rank</th>
<th>Undergraduate</th>
<th>Graduate</th>
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<td>486H1F</td>
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<td>Marbach, P</td>
<td>Assoc.Professor</td>
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<tr>
<td>Penn, G</td>
<td>Assoc.Professor</td>
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<td>401H1S / 2519F / 2511S</td>
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<td>Truong, K</td>
<td>Asst.Professor</td>
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<td>Wilson, G</td>
<td>Asst.Professor</td>
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</table>

**Category 2:** None

**Category 3:** None

**Category 4:** None

**Category 5:** None

**Category 6:** None
2.5. Commitment of faculty members from other graduate programs and/or from other institutions

None.

3. PHYSICAL AND FINANCIAL RESOURCES

3.1. Library resources

Library facilities at the University of Toronto are excellent—the University of Toronto Library system is one of the largest in North America and its holdings of computing-related materials are extensive. The university’s various libraries work together to
facilitate resource sharing and to ensure that their resources, and the resources of local research hospitals, are easily accessible to users at any time. Electronic links exist to all major relevant archives, particularly those of the Association for Computing Machinery (ACM), the Institute of Electrical and Electronics Engineers (IEEE), and the Society for Industrial and Applied Mathematics (SIAM). The Library offers an on-line catalogue and links to 15,000 electronic journals, some 60% of which have the full text of their articles available. A summary statement by the Chief Librarian of the University of Toronto on holdings pertinent to the fields of study included in the M.Sc.A.C., the University’s collection policy, and expenditures is attached as Appendix IV.

3.2. Laboratory facilities

As a department, DCS boasts some of the best research facilities in Canada. These include specialized laboratories dedicated to experimental research in the areas of systems, networking, software engineering, graphics and human-computer interaction, and databases. The graphics and human-computer interaction laboratory is equipped with over $3M of state-of-the-art equipment. This includes high-end optical motion capture systems and laser scanners to enable capture of dynamic properties of human motion as well as of physical objects; 3D printers and laser cutters to enable physical prototyping; a variety of next-generation displays including a 18 projector 16’x6’ display wall with touch sensitive screen, a true 3D volumetric display, and multi-touch tabletop displays; still and video camera arrays; and numerous computing resources including a large compute cluster. This is by far the best equipped laboratory of its kind in Canada, and is amongst the top five worldwide. The systems and networking labs are also well equipped for research in experimental systems research, including several computing clusters, advanced networking hardware, and space for students to build and experiment with new computing infrastructures. The database and software engineering labs are newly renovated spaces that provide an excellent collaboration environment for researchers in this area. In addition to these labs dedicated to experimental research, the numerical analysis, artificial intelligence, and theoretical computer science groups in the department also have dedicated spaces intended to foster collaboration amongst group members. In aggregate, these laboratories are in three separate buildings, including a significant portion of the Bahen Center for Information Technology—an award winning facility dedicated to research in Information and Communication Technology.

3.3. Computer facilities

All M.Sc.A.C. students will be provided with a standard University of Toronto account that will give them access to electronic mail facilities, the Internet, and a wide variety of tools and services. The University of Toronto Information Commons, Computer and Networking Services, Software Distribution Service, and Resource Centre on Academic Technology provide extensive computer support to students. All students in the M.Sc.A.C. are expected to have access to a home/office PC or laptop with internet access, electronic mail, and general office software. M.Sc.A.C. students will also be provided with accounts giving them access to shared DCS teaching computing facilities, which include compute and database servers, and workstations that provide access to a wide array of software packages (such as Matlab), laser
printers, and DCS wired and wireless networks. In particular, this means that M.Sc.A.C. students will have access to the department’s collection of more than half a dozen shared teaching laboratories, each containing twelve to twenty-four workstations (approximately 150 in total). Further access to specialized facilities belonging to particular research groups (e.g. innovative user interface devices or high-performance computing clusters) will be determined on a course-by-course or project-by-project basis, taking into account the student’s need and the likely impact of their work on both the department’s and the research group’s interests. In general, industrial project partners will be expected to provision internship students. However, industrial partners may be given some level of access to departmental or research group facilities on either a free or paid basis. Decisions regarding this will be made case-by-case by the Program Director in consultation with academic members of any affected research groups.

3.4. Space

M.Sc.A.C. students’ enrolment in existing graduate courses is not expected to require any significant changes in the space allocation for those courses, as the percentage increase is comparable to the year-on-year variation in normal enrolment. Lecture space will be found for the two new courses (CSC2701 and CSC2702). As noted, one or the other of these will be run as an evening course during the eight-month internship, which will make room scheduling somewhat easier. Faculty associated with the program will continue to work from the office/space already assigned to them. The Program Director will use her/his existing office for administrative purposes, as this position will not be a full-time responsibility.

During the M.Sc.A.C. program’s ramp-up period, students will be housed in existing graduate space during their eight months of classes. The full-time internship ensures that there will not be overlap on campus between cohorts. As numbers increase to the projected steady state, the department may reprovision space in the Sandford Fleming Building (SF4303 and SF4303F) to accommodate them. Funds required for this will be drawn from program fees.

3.5. Financial support of graduate students

The M.Sc.A.C. program will be entirely self-funded: students will not generally be eligible for NSERC grants, Ontario Graduate Scholarships, or other research-oriented support. DCS may allow them access to departmental scholarships and similar funds administered at the department’s discretion.

4. PROGRAM REGULATIONS AND COURSES

4.1. The intellectual development and the educational experience of the student

Like students in our other graduate programs, M.Sc.A.C. students will be challenged by courses which will provide the motivation, scientific basis, and state of current knowledge in a wide variety of subject areas. These foundations will be complemented by research ideas that will move the field significantly beyond its current state. All of our courses require rigorous analysis; many also require students
to demonstrate the ability to undertake successful implementations where appropriate through significant projects. Instructors make themselves available as much as possible for individual meetings; other than small seminar courses, most also have Ph.D. students assigned as teaching assistants who make themselves available for further discussion.

The graduate environment, however, is much more than course work. All graduate students are expected to attend seminars relevant to their interests as well as more general colloquia featuring distinguished international scholars. The department supports weekly seminars in all research areas featuring visiting scholars as well as seminars based on faculty research and student research. In particular, every research M.Sc. student continuing on to the Ph.D. program presents a seminar based on their research. Beyond these departmentally-organized seminars and colloquia, graduate students often run more informal seminars at which they present recent conference papers as well as give preliminary reports on their own work.

In order to ensure that M.Sc.A.C. students are fully engaged in these activities, they will be required to give a presentation near the end of their internship summarizing their experiences and the contributions they have made. Also, as discussed elsewhere, M.Sc.A.C. students will be enrolled in one of the two special business-oriented courses during their internship. Scheduling the course this way will facilitate discussions as to the progress of the internship and any issues that may arise. While we expect and will promote complete integration of all graduate students, it is expected that these two special courses and the commonality of an internship will foster additional cohesiveness amongst M.Sc.A.C. students.

Beyond the activities within the department, the University of Toronto sponsors a wide variety of seminars and colloquia for all members of the University community as well as the general public. We frequently enjoy thought provoking presentations by Nobel Prize winners, internationally acclaimed artists and authors, and major political leaders.

4.2. Program regulations

Admission requirements

The general regulations of the School of Graduate Studies will govern the admissions process for the M.Sc.A.C.. Applicants to this program must have completed a recognized 4-year BSc in computer science or its equivalent (e.g., an undergraduate degree in Electrical Engineering or Software Engineering); have obtained a minimum GPA of B+ (77–79%) over their final two years of (full-time) undergraduate studies; arrange for three letters of support from faculty and/or employers familiar with their work; and provide a statement of purpose.

Program requirements

The Master of Science in Applied Computing is a 7.0 FCE program composed of 3.5 FCE of required courses including 2.5 FCE of general DCS graduate courses, 1.0 FCE of program-specific graduate courses described in Section 4.4 (CSC2701 and CSC2702), and successful completion of a two-term (eight-month) full-time industrial internship worth 3.5 FCE. To ensure cohesion within each cohort, and to facilitate informal ongoing progress monitoring, one of the two new courses created
specifically for this program will be put on as an evening course during the eight-month internship. To meet the needs of both the M.Sc.A.C. and research programs, the department is in the process of defining foundational courses that will provide a broad overview of the core areas of computer science. Students may include up to 1.0 FCE of elective courses from related departments with the prior approval of the Program Director. There is no thesis requirement.

The M.Sc.A.C. will not initially have an explicit breadth requirement. Rather, the department will identify a range of “foundational courses” which will provide the necessary background for a subject area and then proceed to bring students to the current state of knowledge and practice in the area. Foundational courses will also identify the state of some current research so that students will be then be prepared for more advanced courses and related internships. While we envision a range of backgrounds and undergraduate preparation, normally we would expect MACS students to take between 2 and 4 foundational courses and at least one advanced course. Course selection for each individual student will be approved by the Program Director.

The M.Sc.A.C. industrial internship is what distinguishes this program from the department’s research M.Sc. and other graduate-level programs in Canada. Students spend the second eight months of the program in a full-time internship sited at a local company, non-profit, or open source organization. The focus is technology transfer: students must take a novel idea from computer science research and translate those ideas into insightful models and analysis and/or commercial-quality software in order to demonstrate mastery of both the intellectual domain and professional practices.

Interns will negotiate salaries with host companies on a case-by-case basis. All of the companies contacted in the spring and summer of 2008 stated that they would expect to pay M.Sc.A.C. interns at the same rate as, or higher than, undergraduate PEY and co-op students (currently $36-$45K, or roughly two thirds to three quarters of a junior developer’s salary). Discussions with Mathematics and Information Technology and Complex Systems (MITACS) indicate that many internships should qualify for partial funding under the MITACS ACCELERATE CANADA program, which would offset half of employers’ costs, and thereby make interns even more attractive.

Intellectual property rights will also be negotiated on a case-by-case basis with the involvement of the M.Sc.A.C. Program Director or an appointed alternate. The university will provide a small number of templates to use as starting points for these discussions; these will be reviewed and updated on an annual basis. All of the companies contacted in the spring and summer of 2008 understood that interns would need to be able to discuss their work publicly in order to be evaluated, and believed that equitable arrangements could easily be reached.

The program’s support for establishing and maintaining industrial partners for internships is key to attracting students. Students will not only gain practical experience in technology transfer, but will also have access to well-trained professional support staff in their host company to realize their vision and make further connections in industry. Our market survey and other research have
demonstrated that potential applicants and company partners will value this opportunity highly.

The Program Director will play an active role in coordinating internships. Each project will be monitored by a faculty sponsor, a representative from the host company, and the M.Sc.A.C. Program Director or an appointed alternate. Students will be required to report progress three times during their internship (mid-summer, September, and late October), and to present the final results of their work at the end of the internship. Internships will be evaluated on a CR/NCR basis.

**Language requirements**

Facility in the English language must be demonstrated by all applicants whose primary language is not English, as set out in the SGS calendar.

**Distance delivery**

Not applicable.

### 4.3. Part-time studies

The program will not initially be offered on a part-time basis. The department will revisit this issue at the end of the program’s second year in light of experience gained with the first two cohorts.

### 4.4. Total graduate courses listed and level

New courses developed specifically for this program will be CSC2701 and CSC2702.

**CSC2104H: Formal Methods of Program Design**

This course examines the use of logic as an aid to programming. Topics include refinement, formal semantics of programming languages, recursive definition and the least fixed-point construction, the semantics of data types, data refinement. Imperative programs, functional programs, parallel processes, and communicating processes.

**CSC2107H: Compilers and Interpreters**

Topics covered include compiler organization, compiler writing tools, use of regular expressions, finite automata and context-free grammars, scanning and parsing, runtime organization, semantic analysis, implementing the runtime model, storage allocation, and code generation.

**CSC2108H: Automated Verification**

This course introduces the state of the art model checking algorithms and technology. Topics include symbolic, automata-theoretic, bounded and game-theoretic approaches to model checking, query-checking, abstraction and refinement, and techniques for model checking software. The course also gives students hands-on experience with current model-checking tools.
CSC2130H: Empirical Research Methods in Software Engineering
This course explores the role of empirical research in software engineering, and prepares students to do it by examining how to plan, conduct and report on empirical investigations. The course covers controlled experiment, case studies, surveys, archival analysis, action research and ethnographies, and relates these methods to relevant metatheories in the philosophy and sociology of science.

CSC2203H: Packet Switch and Network Architectures
This course introduces the theory and practice of designing packet switches, such as Internet routers, Ethernet switches, and ATM switches. It consists of two parts: the first develops basic tools from queueing theory, stochastic analysis, and algorithms, while the second focuses on packet switch architectures, the evolution of switches and routers, and practical issues in this area.

CSC2204H: Operating Systems
This course looks at the operating system as a control program and as a resource allocator. The concept of a process is central to discussion of synchronization, mutual exclusion, deadlock. Additional topics include memory management, file systems, process scheduling, and protection.

CSC2206H: System Modeling and Analysis
The emphasis of the course is on models for systems with uncertainty. We study the properties of various models and discuss how they can be applied to analyze system performance. Concepts covered include Poisson, renewal, and Markov processes. Case studies involve computer networks, computer systems, and examples from machine learning.

CSC2209H: Computer Networks
The emphasis of this course is on concepts and issues underlying the design and implementation of the Internet. Issues discussed include: naming, routing, Internet topology, congestion control, mobility, applications, and network security.

CSC2221H: Introduction to Distributed Computing
This course studies fundamental problems that arise in distributed systems, such as consensus, reliable broadcast and multicast, and the management of replicated data.

CSC2227H: Topics in the Design and Implementation of Operating Systems
Seminar and discussion of topics in operating system design and implementation based on a collection of papers as class reading. Emphasis is on multiprocessor and distributed operating systems and case studies of contemporary operating systems.

CSC2228H: Topics in Mobile and Pervasive Computing
This course is a broad overview of issues involved in developing mobile and pervasive applications. Topics include wireless technologies, disconnected operation, power and bandwidth adaptation, location awareness and tracking, resource discovery, Mobile-IP, and ad-hoc routing.

CSC2231H: Special Topics in Computer Systems
This course covers modern Internet-scale systems, including topics such as peer-to-peer systems, clusters, web systems, content delivery networks, and Internet security.

CSC2302H: Numerical Solution of Initial Value Problems for Ordinary Differential Equations
This course examines issues involved in the numerical solution of initial value problems in ODEs, error propagation, and the design of robust numerical methods. Methods for stiff and non-stiff problems are reviewed and the difficulties arising in each area identified. State-of-the-art software is surveyed and critically evaluated. Difficulties associated with implicit equations, algebraic constraints, discontinuities, and delay terms are also considered.

CSC2305H: Numerical Methods for Optimization Problems
This course examines optimization along a line, steepest descent methods, Newton’s method, quasi-Newton methods, conjugate gradient methods, variants of Newton’s method for nonlinear least squares problems, projection methods for optimization subject to linear constraints, Lagrangian methods for optimization subject to nonlinear equality constraints, and penalty function methods for optimization subject to nonlinear inequality constraints.
CSC2306H: High-Performance Scientific Computing
This course presents topics relevant to computationally-intensive applications in science and engineering, including implementation of numerical algorithms on parallel architectures, performance evaluation, scientific visualization, and numerical methods.

CSC2307H: Numerical Software
This course presents topics in the development and certification of numerical software, including the analysis of error, stability, reliability, efficiency, robustness, portability, and correctness of programs for numerical computations.

CSC2310H: Computational Methods for Partial Differential Equations
The focus of this course is finite difference and finite element methods for boundary value problems. Topics include convergence of methods, efficiency of the solution of linear systems, finite difference methods for initial value problems, consistency, stability, and convergence.

CSC2321H: Matrix Calculations
This course examines the efficient solution of large sparse systems arising from the discretisation of PDE problems, approximation problems, or other science and engineering problems. Topics include basic iterative solvers, acceleration techniques such as semi-iteration and conjugate gradient, and applications to PDEs such as Schwarz splitting methods, domain decomposition methods, multigrid schemes, and FFT methods.

CSC2322H: Boundary Problems for Ordinary Differential Equations
This course includes a review of initial value methods, shooting methods, collocation, and finite difference methods, and then presents particular areas of difficulty such as singular perturbation problems, bifurcation problems, or parameter fitting.

CSC2401H: Introduction to Computational Complexity
The first and main part of the course introduces complexity theory, discussing models of computation, time and space classes, reductions, randomization, complexity hierarchies, and tradeoffs. The second part covers recent results pertaining to fundamental issues in complexity theory.

CSC2404H: Computability and Logic
This course covers computable functions, Church’s thesis, unsolvable problems, recursively enumerable sets, predicate calculus, including the completeness, compactness and Lowenheim-Skolem theorems, formal theories and the fundamental results of Godel, Church and Tarski.

CSC2405H: Automata Theory
This course studies regular, deterministic, context free, context sensitive and recursively enumerable languages via generative grammars and corresponding automata (finite state machines, pushdown machines and Turing machines). Topics include complexity bounds for recognition, language decision problems and operations on languages.

CSC2410H: Introduction to Graph Theory
This course covers many of the most important aspects of graph theory, including the development and analysis of algorithms for problems which arise in applications of graph theory. Topics include minimum spanning tree, shortest path problems, network flow with applications to bipartite matching, general matching, and graph colorability. Attention is given to the mathematical theory that supports the algorithms presented.

**CSC2411H: Linear Programming and Combinatorial Optimization**
This course deals with the problem of optimizing linear functions in linear or other convex domains, and application to the theory of algorithms. Topics covered include algebraic and geometric foundations of linear programming, the Simplex Method, the Ellipsoid algorithm, the concept of Duality, and applications such as Von Neumann minimax principle in game-theory, Yao’s minimax principle and the “Primal-Dual” algorithmic paradigm. We will then discuss positive-semi-definite programming and how it can be solved using the Ellipsoid algorithm.

**CSC2413H: Combinatorial Methods**
This course covers advanced topics in combinatorial theory chosen from a variety of areas, including enumeration, combinatorial identities, generating functions, graphs, and difference nets.

**CSC2414H: Topics in Applied Discrete Mathematics**
The topics discussed in this course vary from year to year. Recent offerings have focused on two different topics that are playing a fundamental role in complexity theory and algorithm design, namely metric embedding and coding theory.

**CSC2415H: Advanced Topics in Distributed Computing**
This course covers current topics in the theory of distributed computing. Recent offerings have examined failure detectors, the robustness of the consensus hierarchy, t-resilient versus wait-free implementations of shared objects, and lower bound techniques for distributed computing.

**CSC2417H: Algorithms for Genome Analysis**
This course covers algorithms that have been developed to analyze genomic and functional data, including genome comparison and assembly, gene prediction, localization of regulatory elements in the genome, and analysis and comparison of biological networks. The emphasis is on discrete algorithms, but probabilistic models such as HMMs will also be discussed.

**CSC2418H: Computational Structural Biology**
This course covers the computational aspects of structural biology: the modeling and computer simulation of structure, function, and dynamics of biological molecules. Topics include algorithms to facilitate protein structure determination by x-ray crystallography and nuclear magnetic resonance spectroscopy, protein-protein interactions, computer-assisted pharmaceutical design, and structure/function analysis.

**CSC2426H: Fundamentals of Cryptography**
Topics in this course include rigorous definitions of security for pseudo-random generators, digital signature schemes, secure hash families, and public-key encryption; methods (including number-theoretic conjectures) for constructing these
secure cryptographic primitives; and methods for using secure primitives to achieve secure session-key exchange and secure sessions.
CSC2427H: Topics in Graph Theory
This course will provide an introduction to the basic tools of the probabilistic method, including the first moment method, the second moment method, the Lovasz Local Lemma, concentration bounds and the semi-random method, along with algorithmic aspects of these tools.

CSC2429H: Topics in Computational Complexity
This course explores various current themes in complexity theory. One such theme is the development of a three-way connection between complexity classes, formal theories of arithmetic, and propositional proof systems. Each of several standards complexity classes, including AC0, NC1, Polytime, and PH has a corresponding theory formalizing reasoning using concepts in that class, and corresponding to each theory there is a propositional proof system representing a nonuniform version of the theory.

CSC2431H: Topics in Computational Molecular Biology
This course begins with an introduction to several open problems in computational biology including background lectures on relevant biology. Two or three of the presented problems are then tackled as a group; appropriate grounding literature on all three projects is read, and solutions explored through that involve ideas from various computational subdisciplines.

CSC2501H: Computational Linguistics
This course covers computational linguistics and the understanding of language by computer. Topics include augmented context-free grammars; chart parsing, statistical parsing; semantics and semantic interpretation; ambiguity resolution techniques; discourse structure and reference resolution. The course emphasizes statistical learning methods for lexical, syntactic and semantic knowledge.

CSC2502H: Knowledge Representation and Reasoning
This course discusses ways to represent knowledge symbolically in a form suitable for automated reasoning, and associated reasoning methods. Topics include first-order logic, entailment, the resolution method, Horn clauses, procedural representations, production systems, object-oriented systems, description logics, inheritance networks, defaults and probabilities, abductive explanation, the representation of action, and planning.

CSC2503H: Foundations of Computer Vision
This course is an introduction to vision, visual processes, and image understanding. Topics include scene lighting and reflectance models, camera system geometry and image acquisition, the robust estimation of edges, lines, and regions, perceptual organization, view-based image models, image matching and feature-based correspondence, estimation of motion and visual tracking, multi-view geometry, projective and metric reconstructions, and object recognition.

CSC2504H: Computer Graphics
This course introduces the basic concepts and algorithms of modern 3D computer graphics. Topics include colour representation, display devices, optics and imaging, representations of curves and surfaces, geometric transformations, clipping, visibility, local illumination, global illumination, sampling, and graphics hardware. Students will implement algorithms and generate images and animations.
CSC2507H: Conceptual Modeling
This course teaches conceptual modeling notations and how to use them. The bulk of the course is dedicated to the introduction of modeling languages and their features, including the Unified Modeling Language (UML), CLASSIC, and KAOS. In addition, the course reviews the history of conceptual modeling, early modeling languages, and more advanced topics, such as ontologies, metamodeling, modeling intentions and social settings.

CSC2508H: Advanced Database Management Systems
The purpose of the course is to prepare students for research in data management by covering seminal papers on topics such as query optimization, query processing algorithms, buffer management and database performance. It also covers topics such as parallel database architectures, object relational databases, benchmarking and advanced indexing and searching.

CSC2511H: Natural Language Computing
This course introduces techniques involving natural language and speech in applications such as information retrieval, extraction, and filtering, intelligent Web searching, spelling and grammar checking, speech recognition and synthesis, and multi-lingual systems including machine translation. N-grams, POS-tagging, semantic distance metrics, indexing, on-line lexicons and thesauri, markup languages, collections of on-line documents, and corpus analysis are included.

CSC2512H: Constraint Satisfaction Problems
This course discusses algorithms and techniques for solving constraint satisfaction problems (CSPs). Topics include an introduction to the formalism, an examination of the range of problems that can be encoded as CSPs, and systematic algorithms for solving CSPs, particularly backtracking. The course will examine a number of improvements to the generic backtracking algorithm, including the algorithms that are in use in various commercial systems and the famous Davis-Putnam algorithm.

CSC2514H: Human-Computer Interaction
This course focuses on the underlying models of human-computer interaction, rigorous evaluation, and research frontiers. Topics include models of HCI from the human and device perspectives, evaluation methodologies, experimental design, analysis techniques, state-of-the-art and future user interfaces, and research directions.

CSC2515H: Introduction to Machine Learning
This course covers basic methods for classification, regression, clustering, time series modeling, and novelty detection. Algorithms discussed include K-nearest neighbours, naive Bayes, decision trees, support vector machines, logistic regression, generalized additive models, K-means, mixtures of Gaussians, hidden markov models, principal components analysis, factor analysis and independent components analysis.

CSC2518H: Spoken Language Processing
This course is an introduction to working with speech in natural language processing systems. Topics include articulatory and acoustic phonetics, prosody and information structure, introduction to digital signal processing of speech, automated speech recognition, text-to-speech synthesis, language models, dialogue modeling and dialogue systems.

CSC2519H: Natural Language Semantics
An introduction to the study of meaning, its formal representation, its derivation from natural language syntactic structures, and its combination through inference with knowledge about the world. Topics include the philosophy of language, compositionality, categorical grammar, quantification and plurality, underspecification, lexical semantics, word-sense disambiguation, lexical choice and nuances of meaning, calculating semantic distance, semantic interpretation in natural language processing systems, and reasoning with the event calculus in natural language.

CSC2521H: Topics in Computer Graphics
The topics in this course change from year to year. Most recently, the focus was non-photorealistic rendering (NPR), an area of computer graphics that focuses on enabling a wide variety of expressive styles for digital art. NPR is inspired by artistic styles such as painting, drawing, technical illustration and animated cartoons, and has appeared in movies and video games in the form of “toon shaders”, as well as in architectural illustration and experimental animation. The goal of this course is to study the state-of-the-art in NPR and to develop new insights as to how art and illustration can be modeled as computational processes.

CSC2522H: Advanced Image Synthesis
This course studies advanced algorithms and architecture for image synthesis, including algorithms for higher level modeling primitives, shading models, antialiasing, stochastic modeling, and designs for high performance display systems, particularly raster displays. Various high-performance raster systems are used as case studies, and the course includes implementation projects on one or more of them.

CSC2523H: Object Modeling and Recognition
This course explores issues in computer vision from the standpoint of 3D object modeling and recognition. A variety of current object modeling schemes are contrasted, including object-centered vs. viewer-centered models, physical vs. geometrical models, deformable vs. rigid models, and geometrical vs. functional models. Recognition algorithms including constrained search, alignment, geometric hashing, and appearance-based recognition are presented and evaluated in the context of particular object recognition tasks.

CSC2525H: Research Topics in Data Management
This is an advanced graduate reading course in data management research; topics may include data mining, data integration, and data management in peer-to-peer systems.

CSC2528H: Advanced Computational Linguistics
This seminar-style course discusses recent research papers in computational linguistics and natural language processing. Students take turns choosing the topics and the papers, presenting the material, and leading the discussions.

**CSC2529H: Computer Animation**
The primary focus of this course is kinematic and dynamic techniques for character animation. Topics include physical modeling and simulation, motion planning, control and learning algorithms, locomotion, motion trajectory optimization, scripting languages, motion capture, and motion editing. Students will implement algorithms and interactive animation tools and then use these to produce motion for animations.

**CSC2530H: Computer Vision for Advanced Digital Photography**
This course takes a unified approach to computer graphics and computer vision. Vision (image analysis) and graphics (image synthesis) are studied formally as mutually converse problems. The course explores physics-based models and associated computational methods for tackling these problems. The emphasis is on modeling and estimating the shapes and motions of rigid and deformable objects using mathematical physics, variational methods, and numerical simulation with finite-difference, finite-element, and multiscale algorithms.

**CSC2531H: Advanced Topics in Data Management Systems**
This course covers information integration, data warehousing, and OLAP, reviews relational databases and query languages, and proceeds to conjunctive queries and data warehousing concepts.

**CSC2535H: Learning Algorithms for Neural Networks**
This course covers learning algorithms for networks of neuron-like processors. Topics include the backpropagation algorithm and some pattern recognition applications, ways to make backpropagation converge faster and generalize better, mixtures of experts, autoencoder networks and their relationship to other dimensionality-reduction methods, the EM algorithm for learning simple directed belief nets, Gibbs sampling, and variational methods for learning intractable directed belief nets.

**CSC2539H: Topics in Computer Vision**
This course explores recent advances and emerging areas of computer vision using a mix of lectures, assignments, seminars, and student presentations. Topics covered include pose detection and estimation, face detection and biometrics, motion estimation and visual tracking, multi-object tracking, event detection and activity recognition, and the analysis of scene dynamics.

**CSC2540H: Special Topics in Computational Linguistics**
This is an advanced graduate seminar covering a topic in computational linguistics. The material draws on research readings, and the format emphasizes class discussion.

**CSC2541H: Topics in Machine Learning**
This course explores how Bayesian statistical methods can be applied to problems in machine learning. Topics include the theory of Bayesian inference, methods for performing Bayesian computations, including Markov chain Monte Carlo and
variational approximation, and ways of constructing Bayesian models, particularly models that are appropriate for the high dimensional problems that often arise in fields such as bioinformatics.

**CSC2542H: Topics in Knowledge Representation and Reasoning**
This seminar course explores recent advances in knowledge representation and reasoning. The course draws predominantly on research readings, and the format is a mix of class lectures, seminars, and student paper presentations.

**CSC2543H: Research Topics in XML Retrieval**
This research seminar focuses on recent developments in the area of XML retrieval. The course covers both the problem space (basic concepts, requirements and models) and the solution space (approaches and techniques). Evaluation is based on course presentations and a project that focuses on developing and/or evaluating techniques in the context of the INEX (Initiative for the Evaluation on XML Retrieval) project.

**CSC2600H: Convex Optimization**
This course is an introduction to the theory, algorithms and applications of convex optimization. Topics are selected from convex sets and functions, linear and quadratic optimization, geometric and semidefinite programming, strong and weak duality, algorithms for constrained and unconstrained problems, interior point methods, and applications.

**CSC2701: Communication for Computer Scientists**
Having the right idea is not enough: in order to be a technical leader, you must be able to communicate your ideas clearly and persuasively. This may be done by traditional means, such as writing reports, publishing in technical journals, or presenting directly to colleagues, or it may be done using newer methods such as blogging. This course introduces the techniques needed to do this, and drills students in their application. Students’ active involvement and participation in each class is strongly emphasized. Regular weekly meetings will include sessions on pedagogical methods, scientific writing, research in technical communication, the construction and defense of logical arguments, and effective communication in the workplace. Students will be asked in most weeks to submit short written papers and frequent short oral presentations; the instructor will provide detailed written and oral feedback.

**CSC2702: Technical Entrepreneurship**
This new course, which is also being created for the M.Sc.A.C., introduces fundamental concepts from business and management that are relevant to technical entrepreneurs who are starting their own business or bringing new ideas to fruition within existing ones. The course is structured around case studies and discussion with leading practitioners from industry. The specific topics covered will vary from offering to offering, but will usually include marketing and product planning, intellectual property rights, product liability, project management, human resource management, and basic accounting principles.
4.5 Collateral and supporting departments
See Appendix V for letters of support from other departments and industry.

5. OUTCOMES
5.1. Enrolment and graduations
Not applicable at this time for this new program

5.2. Employment
No statistical information available at this time for this new program.

5.3. Publications
Not applicable at this time for this new program

5.4. Projected graduate intake and enrolments
Initial student intake will be six students per year, increasing to a maximum of approximately 24 students per year by 2012–2013.

TABLE 14

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<th>YEAR</th>
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Department of Computer Science

Faculty Affiliation
Arts and Science

Degree Programs Offered
Master of Science in Applied Computing (M.Sc.A.C.)

Collaborative Programs
None.

Overview
The Master of Science in Applied Computing (M.Sc.A.C.) is a 16-month professional master's program comprising 3.5 FCE of coursework and an eight-month industrial internship. The internship, which is weighted as 3.5 FCE, is coordinated by the department, and evaluated on a pass/fail basis. The program is intended for students with an undergraduate degree in Computer Science or a related discipline who want to expand their academic competence but do not intend to pursue careers in pure research. There is no thesis requirement.

Contact and Address
Bahen Centre for Information Technology
40 St. George Street, Room 4242
Toronto, Ontario M5S 2E4
Canada
Web: http://www.cs.utoronto.ca/msac
E-mail: msac@cs.utoronto.ca
Telephone: (416) 978 7816
Fax: (416) 946 7132

Degree Programs

Master of Science in Applied Computing

Minimum Admission Requirements
- Successful completion of an undergraduate degree in Computer Science equivalent to a four-year program at the University of Toronto.
- A minimum GPA of B+ (77–79%) over the final two years of undergraduate studies.
- Three letters of support from faculty and/or employers.
- A statement of purpose.
- Applicants whose primary language is not English and who have graduated from a university where the primary language of instruction is not English much achieve a TOEFL score of at least 580 on the paper-based test and 4 on the TWE; 237 on the computer-based test and 4 on the essay writing component; 93/120 on the internet-based test and 22/90 on the writing and speaking sections.
Program Requirements

The Master of Science in Applied Computing is a 7.0 FCE program composed of 3.5 FCE of required courses including 2.5 FCE of general DCS graduate courses, 1.0 FCE of program specific graduate courses described in Section 4.4 (CSC2701 and CSC2702), and successful completion of a two-term (eight-month) full-time industrial internship worth 3.5 FCE. To ensure cohesion within each cohort, and to facilitate informal ongoing progress monitoring, one of the two new courses created specifically for this program will be put on as an evening course during the eight-month internship. To meet the needs of both the M.Sc.A.C. and research programs, the department is in the process of defining foundational courses that will provide a broad overview of the core areas of computer science. Students may include up to 1.0 FCE of elective courses from related departments with the prior approval of the Program Director. There is no thesis requirement.

The M.Sc.A.C. will not initially have an explicit breadth requirement. Rather, the department will identify a range of “foundational courses” which will provide the necessary background for a subject area and then proceed to bring students to the current state of knowledge and practice in the area. Foundational courses will also identify the state of some current research so that students will be then be prepared for more advanced courses and related internships. While we envision a range of backgrounds and undergraduate preparation, normally we would expect MACS students to take between 2 and 4 foundational courses and at least one advanced course. Course selection for each individual student will be approved by the Program Director.

The M.Sc.A.C. industrial internship is what distinguishes this program from the department’s research M.Sc. and other graduate-level programs in Canada. Students spend the second eight months of the program in a full-time internship sited at a local company, non-profit, or open source organization. The focus is technology transfer: students must take a novel idea from computer science research and translate those ideas into insightful models and analysis and/or commercial-quality software in order to demonstrate mastery of both the intellectual domain and professional practices.

Course List

CSC2104H: Formal Methods of Program Design
CSC2107H: Compilers and Interpreters
CSC2108H: Automated Verification
CSC2130H: Empirical Research Methods in Software Engineering
CSC2203H: Packet Switch and Network Architectures
CSC2204H: Operating Systems
CSC2206H: System Modeling and Analysis
CSC2209H: Computer Networks
CSC2221H: Introduction to Distributed Computing
CSC2227H: Topics in the Design and Implementation of Operating Systems
CSC2228H: Topics in Mobile and Pervasive Computing
CSC2231H: Special Topics in Computer Systems
CSC2302H: Numerical Solution of Initial Value Problems for Ordinary Differential Equations
CSC2305H: Numerical Methods for Optimization Problems
CSC2306H: High-Performance Scientific Computing
CSC2307H: Numerical Software
CSC2310H: Computational Methods for Partial Differential Equations
CSC2321H: Matrix Calculations
CSC2322H: Boundary Problems for Ordinary Differential Equations
CSC2401H: Introduction to Computational Complexity
CSC2404H: Computability and Logic
CSC2405H: Automata Theory
CSC2426H: Fundamentals of Cryptography
CSC2410H: Introduction to Graph Theory
CSC2411H: Linear Programming and Combinatorial Optimization
CSC2413H: Combinatorial Methods
CSC2414H: Topics in Applied Discrete Mathematics
CSC2415H: Advanced Topics in Distributed Computing
CSC2417H: Algorithms for Genome Analysis
CSC2418H: Computational Structure Biology
CSC2427H: Topics in Graph Theory
CSC2429H: Topics in Computational Complexity
CSC2431H: Topics in Computational Molecular Biology
CSC2501H: Computational Linguistics
CSC2502H: Knowledge Representation and Reasoning
CSC2503H: Foundations of Computer Vision
CSC2504H: Computer Graphics
CSC2507: Conceptual Modelling
CSC2508: Advanced Database Management Systems
CSC2511H: Natural Language Computing
CSC2512H: Constraint Satisfaction Problems
CSC2515H: Introduction to Machine Learning
CSC2518H: Spoken Language Processing
CSC2519H: Natural Language Semantics
CSC2521H: Topics in Computer Graphics: Physics-Based Character Animation
CSC2522H: Advanced Image Synthesis
CSC2523H: Object Modeling and Recognition
CSC2525H: Research Topics in Data Management
CSC2528H: Advanced Computational Linguistics
CSC2529H: Computer Animation
CSC2530H: Computer Vision for Advanced Digital Photography
CSC2531: Advanced Topics in Data Management Systems
CSC2535H: Learning Algorithms for Neural Networks
CSC2539H: Topics in Computer Vision
CSC2540H: Special Topics in Computational Linguistics
CSC2541H: Topics in Machine Learning
CSC2600H: Convex Optimization
CSC2701: Communication for Computer Scientists
CSC2702: Technical Entrepreneurship

**Graduate Faculty**
For calendar production purposes, faculty data are drawn once a year from the Human Resources Information System (HRIS). Throughout the year, the departmental chair may make appointments to the graduate faculty.
For details, visit [www.sgs.utoronto.ca/adminsupport/gradfac.htm](http://www.sgs.utoronto.ca/adminsupport/gradfac.htm).
MOTION
Graduate Education Council
Tuesday, May 19, 2009

ITEM 8

Proposal to close the following program:
Master of Engineering in Telecommunications (MEngTel)
Department of Electrical and Computer Engineering, Faculty of Arts and Science

MOTION
That Graduate Education Council approve the closure of the Master of Engineering in Telecommunications (MEngTel) degree program in the Department of Electrical and Computer Engineering, effective September 2009.

See attached documents:
• Governance Form A

Governance Note
The program has not enrolled new students this academic year. The last MEngTel student completed their coursework in Fall 2008 and graduated in absentia in March 2009.

Vice-Dean Chris Damaren has approved this proposal on behalf of the Faculty of Applied Science and Engineering Faculty Council. It will be reported to Faculty Council at its next meeting on May 27, 2009.

With GEC approval, the proposal for closure will be sent for approval to the Academic Policy and Planning Committee of Governing Council, Planning and Budget Committee, Academic Board, and Governing Council.
**Governance Form A: General**

2008-2009, Version #1

**Faculty Affiliation:** Faculty of Applied Science and Engineering

**Name of Graduate Unit:** Electrical and Computer Engineering

**Graduate Program/s involved in proposal, if any:**
Master of Engineering in Telecommunications (M.Eng.Tel.)

**Brief Summary of Proposed Change:**
Disestablishment of the Master of Engineering in Telecommunications program (M.Eng.Tel.). Any mention of the MET program, and associated courses (ECE1800Y, ECE1801H, ECE1802H, ECE1803H, ECE1804H) will be removed from the ECE entry of the SGS Calendar 2009-10 edition, and subsequent editions.

**Rationale:**
Declining interest in the MET program coupled with a change in scope of industrial demand for professionals in this area. The expanded M.Eng. program of ECE offers an opportunity to expand the scope of MET within an already established degree program.

**Prior Approvals/Actions:**
The MET program is a professional self-funded masters program. The director of the program consulted with and obtained the approval of the program’s industrial advisory committee. Further, the decision to close the program was taken in consultation with the Chair and Associate Chair (Graduate Studies) of ECE.

No graduate students will be affected by the program closure. The last MET student will complete his final course ECE1518F in 2008 Fall. Upon successful completion of the course he will satisfy the program requirements and be eligible for the degree (either in absentia in March 2009, or convocation in June 2009).

**Proposed Effective Date:**
09 2009
Month Year

**Financial and/or Planning Implications:** None

**Contact Name:**
Until Dec. 31, 2008: Prof. Tarek Abdelrahman; As of Jan. 1, 2009: Prof. Willy Wong

**Submitted by:**
Professor C. Damaren, Vice-Dean, Graduate Studies, Faculty of Applied Science and Engineering

**Date:**
December 8, 2008
MOTION
Graduate Education Council
Tuesday, May 19, 2009

ITEM 9

Proposal to close the following Collaborative Program:
Collaborative Program in Health Care, Technology and Place
Lead Faculty: Faculty of Medicine

MOTION
THAT Graduate Education Council approve the proposal of the Faculty of Medicine to cease admissions to the Collaborative Program in Health Care, Technology and Place, effective September 2009, and to close it when it no longer has any students registered.

See attached documents:
• Governance Form A

Prior Approvals and Discussion

The proposal was approved by the Faculty of Medicine Faculty Council on April 30, 2009. It was asked at the meeting if the Collaborative Program would be reestablished in another department; it was answered that the program was dependant on Canadian Institutes of Health Research funding which was not renewed, and that departments had been informed but no feedback was received. A question was raised asking how students were informed; it was answered that all students, program committee members, departmental chairs and graduate coordinators have been informed by e-mail. It was also asked how currently-enrolled students would be able to complete the program requirements, to which it was answered that all students had completed every requirement except completing a dissertation, and that the program would rely on the students’ supervisors to ensure that this last requirement is fulfilled.

Further Governance

GEC approval is the final University of Toronto approval. It will be sent for information to the Academic Policy and Programs Committee of Academic Board in SGS’s annual report.
Governance Form A: General
2008-2009, Version #1

Faculty Affiliation:
Medicine

Name of Graduate Unit:
Collaborative Program in Health Care, Technology and Place

Graduate Program/s involved in proposal, if any:
Biomedical Engineering, PhD
English, PhD
Health Policy, Management & Evaluation, PhD (home department)
Medical Science, PhD
Nursing Science, PhD
Pharmaceutical Sciences, PhD
Public Health Sciences, PhD
Rehabilitation Science, PhD
Social Work, PhD

Brief Summary of Proposed Change:
Cease admissions to the collaborative program and complete the final closure of the program upon the completion of graduate students currently enrolled.

Rationale:
HCTP was not approved for a second round of funding from CIHR’s Strategic Training Initiative in Health Research (STIHR).

Prior Approvals/Actions:
The HCTP Program Director sent letters to the home department chair, program committee members, participating departments graduate officers, and the 14 PhD students currently enrolled regarding the program closure. Here is a list of the home department and HCPT program committee members notified.

- HPME Chair: Professor Louise Lemieux-Charles
- HCTP Program Committee Members (letters copied to the department graduate program administrators):
  - G. R. Fernie, BSc, PhD, PEng, CCE / Biomedical Engineering
  - E. D. Harvey, BA, MA, PhD / English
  - P. C. Coyte, BA, MA, PhD / Health Policy, Management & Evaluation (Director)
  - O. D. Rotstein, MSc, MD, FRCS(C) / Medical Science
  - E. Hodnett, RN, PhD, FCAHS / Nursing Science
  - L. D. MacKeigan, BScPhm, PhD / Pharmaceutical Sciences
  - B. D. Poland, BA, MA, PhD / Public Health Sciences
  - D. T. Reid, BSc(OT), MEd, PhD / Rehabilitation Science
Proposed Effective Date:
September 2009

Financial and/or Planning Implications:
None

Contact names:
HPME Chair: Louise Lemieux-Charles
HCTP Program Director: Professor Peter C. Coyte

Submitted by:
Andrea Sass-Kortsak, Vice Dean Graduate Affairs

Date: April 17, 2009
MOTION
Graduate Education Council
Tuesday, May 19, 2009

ITEM 10

Proposal to change the degree name and postnomial (the degree shortform) of the following degree offered by the Public Health Sciences program:

From: Master of Health Science, MHSc
To: Master of Public Health, MPH

Dalla Lana School of Public Health, Faculty of Medicine

MOTION

THAT Graduate Education Council approve the proposal of the Faculty of Medicine and the Dalla Lana School of Public Health to change the name and postnomial of the Master of Health Science (MHSc) degree to Master of Public Health (MPH), in the Public Health Sciences program. The change is effective September 2009.

See attached documents:
- SGS Governance Form A
- Calendar Entry

Prior Approvals and Discussion

Only the degree name and postnomial are changing under this proposal; the program name, admission requirements and program requirements remain the same.

This proposal has been discussed at several meetings of the Dalla Lana School of Public Health (DLSPH), attended by faculty, staff, and students, as well as at meetings of the MHSc program directors and has been approved by the Executive Committee of the DLSPH. Students have been consulted, informally, by the MHSc program directors. The Director of the DLSPH held a “town hall” meeting with graduate students (January 27, 2009) and has met with the Public Health Sciences Student Association as well as individual students.

The proposal was approved by the Faculty of Medicine Faculty Council on April 30, 2009. Faculty Council was informed at the meeting that students who registered before September 2009 would have the option of choosing to graduate with either the MHSc or MPH degree beginning with the November 2009 Convocation. It was asked at the meeting whether the change would be confusing, since requirements are not changing; it was answered that since the MPH is an internationally-recognized degree and that the University of Toronto has a very strong reputation in this area, that there would be no confusion.

Further Governance

With GEC approval, the proposal will be sent for information to the Academic Policy and Programs Committee for approval, and to Academic Board for final approval. The proposal will be sent to OCGS for information.
Faculty Affiliation:
Medicine

Name of Graduate Unit:
Public Health Sciences

Graduate Program/s involved in proposal, if any:
Master of Health Science (MHSc) in Public Health Sciences, in five fields:
- Epidemiology
- Family & Community Medicine
- Community Nutrition
- Occupational & Environmental Health
- Social & Behavioural Health Science

Brief Summary of Proposed Change:
To change the degree title and short form (post-nomial) of the professional masters program from Master of Health Science (MHSc) to Master of Public Health (MPH).
Revised calendar entry attached.

Rationale:
- The MPH (Master of Public Health) is the internationally recognized master’s degree for Public Health professionals. The coursework and associated experiences in the existing MHSc degree are equivalent to MPH requirements of other recognized Schools of Public Health (e.g., Harvard, Johns Hopkins, Yale). Therefore it is fitting that the professional master’s degree in Public Health Sciences offered by the newly established Dalla Lana School of Public Health (DLSPH) be consistent with the widely accepted designation in the field.

- This proposal is for a change in the degree title and short form only, and will not involve any changes to the admissions or program requirements of the MHSc program or the program name itself.

- As the DLSPH evolves it may seek accreditation from the Council on Education for Public Health. At this point some changes to the degree program may be required.
Currently enrolled MHSc students will be have the choice of receiving either the MHSc or MPH.

All students admitted in September 2009 will be registered in the MPH.

The change in degree title will not be retroactive for students who have already graduated from the program.

Prior Approvals/Actions:
- This proposal has been discussed at several meetings of the DLSPH, attended by faculty, staff, and students, as well as at meetings of the MHSc program directors and has been approved by the Executive Committee of the Dalla Lana School of Public Health.
- Students have been consulted, informally, by the MHSc program directors. The Director of the DLSPH held a “townhall” meeting with graduate students (January 27, 2009) and has met with the Public Health Sciences Student Association) as well as individual students.

The proposed name change was approved at the following:
- Executive Committee of the Dalla Lana School of Public Health (Feb 10, 2009)
- Departmental Graduate Curriculum Committee (March 13, 2009)
- Faculty of Medicine Graduate Education Committee (pending)

Proposed Effective Date:
September 2009

Financial and/or Planning Implications:
None

Contact name:
Paul Corey, Associate Director, Education
Karin Domnick, Graduate Coordinator

Submitted by:
Andrea Sass-Kortsak
Vice Dean, Graduate Affairs

Date:
17 March, 2009
Public Health Sciences  CHL

Faculty Affiliation
Medicine

Degree Programs Offered
Public Health Sciences – MPH, MSc, PhD, MScCH

Collaborative Programs
The following collaborative programs are available to students in participating degree programs as listed below:
1. Aboriginal Health, see p. 404
   - Public Health Sciences, MPH, MSc, PhD
2. Addiction Studies, see p. 406
   - Public Health Sciences, MPH, MSc, PhD
3. Aging, Palliative and Supportive Care Across the Life Course, see p. 408
   - Public Health Sciences, MPH, MSc, PhD
4. Bioethics, see p. 416
   - Public Health Sciences, MPH, MSc, PhD
5. Cardiovascular Sciences, see p. 426
   - Public Health Sciences, MPH, MSc, PhD
6. Community Development, see p. 428
   - Public Health Sciences, MPH
7. Environment and Health, see p. 439
   - Public Health Sciences, MPH, MSc, PhD
8. Health Care, Technology and Place, see p. 454
   - Public Health Sciences, PhD
9. Health Services and Policy Research, see p. 456
   - Public Health Sciences, MPH, MSc, PhD
10. Sexual Diversity Studies, see p. 478
    - Public Health Sciences, MPH, MSc, PhD
11. Women and Gender Studies, see p. 473
    - Public Health Sciences, MPH, MSc, PhD
12. Women’s Health, see p. 478
    - Public Health Sciences, MPH, MSc, PhD

Overview
The Graduate Department of Public Health Sciences at the Dalla Lana School of Public Health offers four graduate degree programs, available both full time and part time. Applicants are strongly advised to have some background in statistics and quantitative methods, as well as in a social science discipline. In addition, field and employment experience are taken into consideration, especially for the MPH program. A complete description of all programs is available on the departmental Web site: www.sph.utoronto.ca

The Master of Public Health (MPH) degree is designed for students interested in professional and/or research careers in the community, academic, public, or private sectors. Five specializations are offered:
1. Epidemiology
2. Family & Community Medicine
3. Community Nutrition
4. Occupational and Environmental Health
5. Social & Behavioural Health Science

The Master of Science (MSc) program is for students interested in research and academic careers in Biostatistics.

The Doctor of Philosophy (PhD) prepares students for research and academic careers in the Public Health Science disciplines. Specializations include:
1. Biostatistics
2. Epidemiology
3. Social and Behavioural Health Sciences

The PhD program may be completed on a full-time or flexible-time basis.

The Master of Science in Community Health (MScCH) is a program restricted to practising health professionals.

Four specializations are offered:
1. Health Practitioner Teacher Education
2. Family and Community Medicine
3. Public Health Nutrition
4. Wound Prevention and Care

Contact and Address

Web: www.sph.utoronto.ca
E-mail: chl.grad@utoronto.ca
Telephone: (416) 978-2058
Fax: (416) 978-1883

Graduate Department of Public Health Sciences
Room 620, 155 College Street
University of Toronto
Toronto, Ontario M5T 3M7
Canada

Degree Programs

Public Health Sciences

Master of Public Health

Minimum Admission Requirements
- Appropriate four-year undergraduate degree from a recognized university, with a minimum mid-B average in the final year.
- At least one course in undergraduate statistics.
- Relevant work or volunteer experience.
- Each specialization has unique requirements; refer to the Web site for details.
- Applications must be submitted by February 1.

Program Requirements
- 10.0 full course equivalents (FCE), of which 0.5 FCE is a core subject and at least 1.0 FCE is a field practicum.
  - Full-time students, depending on the area of specialization, require between 16 and 22 months to complete the program, including time spent in field practica. Specific program requirements, course sequences, and options vary by area of specialization and are fully explained on the Web site.
  - Part-time students have a maximum of six years to complete the program.
Master of Science

Minimum Admission Requirements
- Appropriate four-year undergraduate degree from the University of Toronto, or its equivalent from a recognized university, with a minimum mid-B average in the final year.
- Applications must be submitted by February 1.

Program Requirements
- Students specializing in Biostatistics may choose a course-only or thesis program. See the Web site for details.
  - Full-time students can complete the program in 12 months.
  - Part-time students have a maximum of five years to complete the program.

Doctor of Philosophy

Minimum Admission Requirements
- Master's degree in a Public Health Science-related discipline from a recognized university, with a minimum A- standing.
- Demonstrated educational and/or professional experience that indicates a capacity to undertake research-oriented doctoral studies.
- Applications must be submitted by January 15.
- Consult the Web site for details.

Program Requirements

Full-Time PhD
- Course requirements vary by specialization and are related to the student's knowledge of the field. Consult the Web site.
- Successful completion of formal examinations and other assessments at specified points within the program to ensure continuation in the program.
- Proficiency in statistics or research methods.
- A written comprehensive examination in the major area of specialization.
- Writing of a PhD thesis under the supervision of an approved thesis committee (supervisor plus two additional faculty members).
- The oral defence of the thesis before an examination committee appointed by the School of Graduate Studies.
- Completion of all degree requirements within six years from first registration in the program.

Flexible-Time PhD
- With the approval of the graduate chair, some applicants may be admitted to a flexible-time PhD program. This program will benefit mature students with career and/or familial obligations.
- Degree requirements for the flexible-time program are identical to those for the full-time PhD program.
- A plan of study and research activities will be negotiated at initial registration, to be reviewed and updated annually.
- Students have up to eight years to complete the program. They are required to register full-time for the first four years of their program. Thereafter, they may register part-time.

Master of Science in Community Health

Minimum Admission Requirements
- An undergraduate degree in a public health specialty and/or one of the regulated health professions in Ontario with the equivalent of a minimum mid-B average in the final academic year.
- Relevant academic preparation and professional experience as either a public health, community, or clinical practitioner.
- Some fields (i.e., FCM, PHN, and WPC) require appropriate certification/licensure in a regulated health profession and may require a valid license to practice in Canada or the student's home jurisdiction.
Applications must be submitted by February 1.

A Diploma in Community Health may be awarded in exceptional circumstances to students who have completed at least 3.5 full-course equivalents of the program requirements, including the required courses for the field, and with the approval of the department.

**Program Requirements**

- The MScCH is a course-work only program which requires the completion of 5.0 full course equivalents (FCE), including 0.5 FCE of a core Public Health Sciences subject; 0.5 to 1.0 FCE in supervised field placements or practica, normally 2.5 FCE in field-specific required courses; and 1.0 to 1.5 FCE in elective courses.
- The specific program requirements, course sequences, and options vary by field of specialization; they are fully outlined on the Web site.
- Students can complete the program in 12 months of intensive full-time study or over a maximum period of 5 years of part-time study.

**Courses**

**Core Courses**

CHL 5004H Introduction to Public Health Sciences

**Biostatistics and Demography**

CHL 5201H Introductory Biostatistics for Students in Biological Sciences I
CHL 5202H Introductory Biostatistics for Students in Biological Sciences II
CHL 5203H Public Health Research Methods
CHL 5204H Survey Methods in Health Sciences II
CHL 5205H Demography and Vital Statistics I
CHL 5206H Demography and Vital Statistics II
CHL 5207Y Laboratory in Statistical Design and Analysis
CHL 5208Y Advanced Laboratory in Statistical Design and Analysis
CHL 5209H Survival Analysis I
CHL 5210H Categorical Data Analysis
CHL 5211H Demographic Analysis
CHL 5220H Community Health Appraisal Methods I
CHL 5221H Community Health Appraisal Methods II
CHL 5222H Longitudinal Data Analysis
CHL 5223H Applied Bayesian Methods
CHL 5224H Statistical Genetics
CHL 5225H Advanced Statistical Methods for Clinical Trials
CHL 5250H Special Topics in Biostatistics
CHL 5251H Survival Analysis II

**Community Nutrition**

Courses offered by the Department of Nutritional Sciences

NFS 1201H Public Health Nutrition
NFS 1204Y Master’s Seminars in Nutritional Sciences (Credit/No Credit)
NFS 1208H Field Observation and Nutrition Program Laboratory I
NFS 1209H Field Observation and Nutrition Program Laboratory II
NFS 1211H Community Nutrition
NFS 1216H Selected Topics in Nutrition
NFS 1218H Recent Advances in Nutritional Sciences I
NFS 1219H Recent Advances in Nutritional Sciences II
NFS 1220H Clinical Nutrition
NFS 1221H Nutrition Programs and Strategies
NFS 1484H Advanced Nutrition

**Epidemiology**
CHL 5401H Epidemiologic Methods I
CHL 5402H Epidemiologic Methods II
CHL 5403H Epidemiology of Non Communicable Diseases
CHL 5404H Research Methods I
CHL 5405H Assessment of Community Health Needs
CHL 5406H Quantitative Methods for Biomedical Research
CHL 5407H Categorical Data Analysis for Epidemiologic Studies
CHL 5408H Research Methods II
CHL 5409H Cancer Epidemiology
CHL 5410H Occupational Epidemiology
CHL 5411H International Health
CHL 5412H Communicable Disease Epidemiology I: Principles
CHL 5413H Public Health Sanitation
CHL 5414H Additional Topics in Epidemiology of Non-Communicable Diseases
CHL 5415H Communicable Disease Epidemiology II: Practice
CHL 5416H Environmental Epidemiology
CHL 5417H Tobacco and Health: From Cells to Society
CHL 5418H Scientific Overview in Epidemiology
CHL 5419H Empirical Perspectives on Social Organization and Health
CHL 5420H Global Health Research
CHL 5421H Aboriginal Health
CHL 5422H Applied Epidemiology and Public Health Policy
CHL 5423H Doctoral Series in Epidemiology
CHL 5424H Advanced Quantitative Methods in Epidemiology
CHL 5450H Special Topics in Epidemiology

Family Medicine

CHL 5601H Teaching Evidence-Based Family Medicine in the Clinical Setting
CHL 5602H Working with Families in Family Medicine
CHL 5603Y Social, Political, and Scientific Issues in Family Medicine
CHL 5604H Human Development Issues for Family Medicine
CHL 5605H Research Issues in Family Medicine/Primary Care
CHL 5606H Research in Family Medicine/Primary Care Methodological Applications
CHL 5607H Teaching and Learning by the Health Professions: Principles and Theories
CHL 5608H Teaching and Learning by the Health Professions: Practical Issues and Approaches
CHL 5609H Continuing Education in the Health Professions
CHL 5610H Theory and Practice of Behaviour Change in Health Professional Settings
CHL 5611H Continuing Education Planning, Management and Evaluation in the Health Professions
CHL 5630Y Wound Prevention and Care

Global Health

CHL 5700H Global Public Health
CHL 5702H History of International Health
CHL 5703H Urban Epidemics

Health Promotion

CHL 5801H Health Promotion
CHL 5802H Planning in Health Promotion and Population Health
CHL 5803H Health Promotion Strategies
CHL 5804H Health Behaviour Change
CHL 5805H Critical Issues in Health Promotion Practice
CHL 5806H Health Promotion Practice Field Inquiry
JXP 5807H Health Communications

Occupational and Environmental Health

CHL 5902H Advanced Occupational Hygiene
CHL 5903H Environmental Health
CHL 5904H Perspectives in Occupational Health and Safety—Legal and Social Context
CHL 5905H Advanced Clinical Studies in Occupational Medicine
CHL 5906H Organization and Management of Occupational Health Services
CHL 5907H Radiological Health
CHL 5910H Occupational and Environmental Hygiene I
CHL 5911H Occupational and Environmental Hygiene II
CHL 5912H Industrial Toxicology
CHL 5914H Physical Agents I—Noise
CHL 5915H Control of Occupational Hazards
CHL 5916H Environmental Health Policy
CHL 5917H Concepts in Safety Management
CHL 5918H Biological Hazards in the Workplace and Community
CHL 5950H Special Topics in Occupational and Environmental Health

Public Health Policy

CHL 5300H Public Health Policy

Social and Behavioral Health Sciences

CHL 5101H Social Theory and Health
CHL 5102H Social and Political Forces in Health
CHL 5103H Sociology of Health in Canada
CHL 5104H Health Psychology
CHL 5105H Social Determinants of Health
CHL 5106H Health and Illness Behaviour in Children and Adolescents
CHL 5108H Work and Well-Being
CHL 5109H Gender and Health
CHL 5110H Theory and Practice of Program Evaluation
CHL 5111H Qualitative Research Methods
CHL 5112H Community Development in Health
CHL 5113H Health and Culture: Meeting the Needs of a Multicultural Society
CHL 5114H Social Science Perspectives on Mental Health
CHL 5115H Qualitative Analysis and Interpretation
CHL 5116H Public Policies to Improve Health
CHL 5117H A Global Perspective on the Health of Women and Children
CHL 5118H International Health, Human Rights, and Peace-Building
CHL 5119H Social and Political Perspectives on Drugs and Addiction
CHL 5120H Population Health Perspectives on Mental Health and Addictions
CHL 5121H Genomics, Bioethics and Public Policy
CHL 5122H Qualitative Research Practice (Credit/No Credit)
CHL 5123H Issues in the Transdisciplinary Research and the Health of Marginalized Population
CHL 5124H Public Health Ethics
CHL 5150H Social Science Research

Practica and Related Courses

CHL 5690H MSc CH Required Practicum (Credit/No Credit)
CHL 5691H MSc CH Optional Practicum (Credit/No Credit)
CHL 6011H* Required MPH Practicum (Credit/No Credit)
CHL 6020Y* Optional MPH Practicum (Credit/No Credit)
CHL 6021H* Optional Practicum Extension (Credit/No Credit)
CHL 6022Y* Long Extension to Optional Practicum (Credit/No Credit)

Reading Courses and Research Projects

CHL 7001H Directed Reading in an Approved Field of Community Health
CHL 7002H Approved Research Project in an Approved Field of Community Health

Collaborative Program Courses

Addiction Studies

CHL 5417H Tobacco and Health: From Cells to Society
PAS 3700H Multidisciplinary Aspects of Addiction Studies
PAS 3701H Advanced Research Issues in Addictions

Aging and the Life Course
AGE 2000H Social Determinants of Aging and Health
AGE 2500H Research Topics in Aging and the Life Course
AGE 3000H Advanced Research Seminar in Aging and the Life Course

*Courses which may continue over a program. The course is graded when completed.

+ Extended course. For academic reasons, course work is extended into session following academic session in which course is offered.

Graduate Faculty

Full Members

Sharon Abel - BSc, MA, PhD
Kenneth Allison - BSc, BPHE, MHSc, MSc, PhD
Gavin John Andrews - BA, PhD
Elizabeth Badley - BSc, MSc, DPhil, PhD
Joseph Belschman - MD
Solomon Beutler - MBChB, FRCP
Arlene Bierman - BA, MD, MS
Anne-Emmanuel Birm - BA, MA, DSc
Susan Bondy - PhD
Norman Boyd - MD, FRCP(C), The Lau Family Chair in Breast Cancer Research
Shelley Bull - BMath, MMath, PhD
Liviana Calzavara - BA, MA, PhD
David Cassidy - BSc, DC, MSc, PhD, Dr Med Sc
Catherine Chalin Clark - BSN, MA, PhD, MDiv
Joanna Cohen - BSc, MHCSc, PhD
Angela Colantonio - BA, BSc, MHCSc, PhD
Donald Cole - BSc, MSc, MD
Mary Corey - BA, MSc, PhD
Paul Corey - BSc, MA, PhD
Pierre Cote - PhD, MSc
Cheryl Cott - Dip(PT), BPT, DipGer, MSc, PhD
Michelle Cotterchio - BSc, MS, MPH, PhD
Michael Cusimano - MHPE, MD, FRCS(C)
Abdallah Daar - DPhil, FRCP(Lond), FRCS, FRCS(C)
Miriam Diamond - MSc, PhD
Joan Eakin - BA, MA, PhD
Gillian Einstein - PhD
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Michael Evans - BSc, MSc, PhD
Gail Eyssen - BSc, MSc, PhD
Bruce Ferguson - BA, MA, PhD
Roberta Ferrence - BA, MA, PhD
Lorraine Ferris - BA, MA, PhD
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Monique Gagnon - BSc, MA, PhD
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Wendy Levinson
Wen-Yi Wendy Lou - PhD
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Loraine Marrett - BMath, PhD
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Patricia McKeever - BN, MSc(A), PhD
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Margaret Millson - BSc, MHSc, MD, FRCP(C)
Salomon Minkin - BSc, MSc, PhD
Carles Muntaner - MD, PhD
Cameron Mustard - AB, ScD
Ted Myers - BA, MSc, MSW, PhD
Steven Narod - BSc, MD, FRCP(C)
C. David Naylor - MD, DPhil, FRCP(C)
Radford Neal - BSc, MSc, PhD
Arnold Noyek - MD, FRCP(C)
Patricia O'Campo - PhD
Elizabeth Peter-Handke - MeN, PhD
Blake Poland - BA, MA, PhD
Helene Polatajko-Howell - BOT, MEd, PhD, OT(C)
James Purdham - BSc, PhD
Janet Raboud - BMath, MSc, PhD
Susan Rappolt - BSc(OT), MSc, PhD
Jurgen Rehm - PhD
Nancy Reid - BMath, MSc, PhD, FRSC
Robert Remis - BSc, MD, MPH
Ann Robertson - BSc, DPH, PhD
Walter Rosser - MD
Brian Rush - PhD
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Eric Single - BA, PhD
Harvey Skinner - BA, MA, PhD
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Kue Young - BSc, MD, MSc, PhD, FRCP, LMCC
David Zakus - BSc, MES, MSc, PhD
Stanley Zlotkin - BSc, MD, PhD, FRCP(C)

Members Emeriti

David Andrews - BSc, MSc, PhD, Fellow ASA
Mary Jane Ashley - MSc, MD, DPH
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Cornelia Baines - BA, BSW, MSW, PhD, MD
Mary Chipman - BSc, MA
E Aileen Clarke - MB, BS, MSc
David Coburn - BA, MA, PhD
David Hewitt - MA
Merrijoy Kelner - PhD
William Leriche - MD
Victor Marshall - BA, MA, PhD
Anthony Miller - MD
Richard Osborn
Irving Rootman - BA, MPH, PhD
Chandrakant Shah - MBBS, DCH, MRCP, FRCP
Blossom Wigdor - BA, PhD

**Associate Members**

Thomas Abemathy - BS, MSc, PhD
Edward Adlaf - BA, MA, PhD
Farah Ahmad
Mathieu Albert - BA, MSc, PhD
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Peter Austin - BSc, MSc, MSc, PhD
Peri Ballantyne - BA, MA, PhD
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Maria Barrera - MA, PhD
Helen Batty - MD, CCFP, MEd, FCFP
Kim Bercovitz - BPE, MSc, PhD
Joseph Beyene - BSc, MSc, PhD
Roxe Bilotta - BSc, MHS, MD, CCFP, FRCP
Malcolm Binns
Anna Bortolus - MSC
Marie Boutiller-Dean - BA, MA, PhD
Katherine Mary Boydell - BA, MHS, PhD
Paul Bozek - BASc, MBA, MEng, PhD
Curtis Breslin - BA, MA, PhD
Joan Brewster - BA, MA, PhD
Laurent Briollais - PhD
Patrick Brown - PhD
Lisa Butler - PhD
John Cairney - PhD
Russell Callaghan - PhD
Kent Campbell - BSc, PhD
Monica Campbell - BSc, MES, PhD
Lissa Ceolin - MHS
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Kathryn Church - BA, MA, PhD
David Davis - BA, MD, FCFP, CCFP
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Weizhen Dong - MA, PhD
Ian Drummond - PhD
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James Dunn - BA, MA, PhD
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Lois Green - PhD
Celia Greenwood - PhD
Helene Greig - PhD
Allan Grill - MD
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Curtis Handford
Shelley Harris - MSc, PhD
Trevor Hart
James Heller - BASc, MAs, PhD, DECH
Frederik Hendriks - BSA
MOTION
Graduate Education Council
Tuesday, May 19, 2009

ITEM 11

Proposal to assign a hood for the following degree offered by the Public Health Sciences program:
Master of Public Health, MPH
Dalla Lana School of Public Health, Faculty of Medicine

MOTION
THAT Graduate Education Council approve the proposal to assign the use of the hood for the Master of Health Science (MHSc) degree also to the Master of Public Health (MPH) degree. The MPH degree is offered by the Public Health Sciences program beginning in September 2009. The use of the hood will commence with the November 2009 Convocation, pending final approvals of the new degree name.

Prior Approvals and Discussion
It is the responsibility of Graduate Education Council (GEC) to receive and approve proposed hood designs. The School of Graduate Studies consulted on this proposal with the Governing Council Secretariat and with Graduate Chairs of units whose programs offer the MHSc degree. No objections were raised to the MPH and MHSc degrees sharing the same hood.

Further Governance
GEC approval is the final approval for assigning the hood to the degree. This proposal is dependent on the proposed renaming of the Master of Health Science (MHSc) degree to Master of Public Health (MPH), in the Public Health Sciences program. GEC approval is the final University approval for renaming the degree, but it also requires approval from OCGS.
MOTION
Graduate Education Council
Tuesday, May 19, 2009

ITEM 12.1

Proposal to change the program requirements for the following program:
Biochemistry, MSc, PhD
Department of Biochemistry, Faculty of Medicine

MOTION
THAT Graduate Education Council approve the proposal of the Faculty of Medicine, Department of Biochemistry, to change the program requirements of the Biochemistry program as follows:

• for both MSc and PhD students, add a choice to the required course allowing them to take the existing course BCH 2021H “Selected Topics in Biochemistry” or the new course BCH 2024H “Focused Topics in Biochemistry”
• allow PhD students to count both BCH 2021H and BCH 2024H toward their total required courses

The overall number of courses required is not changing. This change is effective September 2009.

See attached documents:
• SGS Governance Form A
• Calendar Entry

Prior Approvals and Discussion

The differences between BCH 2021H “Selected Topics in Biochemistry” and BCH 2024H “Focused Topics in Biochemistry” stem primarily from the breadth of the course material presented in the two courses. BCH 2024H will involve twelve hours of in-class instruction and deal with a smaller number of concepts or areas than what would be covered in BCH 2021H. Moreover, BCH 2024H will typically involve fewer instructors and a smaller class size than a course like BCH 2021. Most importantly, BCH 2024H will provide a mechanism for delivering more specialized material to a smaller subset of students – a need that arises from the fact that the department has become quite interdisciplinary in nature.

The proposal was approved by the Biochemistry Departmental Meeting on February 13, 2009. It was approved by the Faculty of Medicine Faculty Council on April 30, 2009. It was asked at the Faculty Council meeting if there is a plan to eliminate the existing course BCH 2021H; at this point, the Department does not plan to do so.

Further Governance

GEC approval is final. It will be sent for information to the Academic Policy and Programs Committee of Academic Board in SGS’s annual report.
Faculty Affiliation: Medicine

Name of Graduate Unit: Biochemistry

Graduate Program/s involved in proposal, if any: M.Sc. and Ph.D.

Brief Summary of Proposed Change:
Currently both MSc and PhD students in the Department of Biochemistry must take BCH2021H. The proposal is to allow MSc and PhD students a choice of either taking the existing BCH2021H OR the new course BCH2024H. Doctoral students will be allowed to take both courses. The overall number of course requirements for the M.Sc. and Ph.D. is not changing.

Rationale:
Permitting students to take either the new course, BCH2024H, or the existing course, BCH2021H, will provide students with more flexibility and choice in their programs by increasing the breadth of topics students may choose from. This is in keeping with the increasingly interdisciplinary nature of the department.

Prior Approvals/Actions:
Biochemistry departmental meeting February 13, 2008
To be approved Faculty of Medicine Graduate Curriculum meeting April 30, 2009.

Proposed Effective Date:
09  2009
Month  Year

Financial and/or Planning Implications:
None

Contact name:
Dr. James Rini
Graduate Co-ordinator, Biochemistry

Submitted by:
Andrea Sass-Kortsak
Vice Dean, Graduate Affairs
Faculty of Medicine

Date: 15 April, 2009
Biochemistry

Faculty Affiliation
Medicine

Degree Programs Offered
Biochemistry - MSc, PhD

Collaborative Programs
The following collaborative programs are available to students in participating degree programs as listed below:
1. Biomedical Engineering
   - Biochemistry, MSc, PhD
2. Biomolecular Structure
   - Biochemistry, PhD
3. Developmental Biology
   - Biochemistry, PhD
4. Genome Biology and Bioinformatics
   - Biochemistry, PhD
5. Neuroscience
   - Biochemistry, MSc, PhD

Overview
Biochemistry is the study of the molecular events underlying biological processes. Consequently it makes fundamental contributions to all disciplines concerned with living systems. The Department offers modern facilities for research leading to the MSc and PhD degrees in a wide variety of areas including the relationship between structure and biological function in proteins, nucleic acids, and lipids as well as complex multi-component systems such as membranes and subcellular organelles.

Contact and Address
Web: biochemistry.utoronto.ca
E-mail: biochemistry@utoronto.ca
Telephone: (416) 978-2702
Fax: (416) 946-8228

Department of Biochemistry
Room 5205, Medical Sciences Building
University of Toronto
Toronto, Ontario M5S 1A8
Canada

Degree Programs

Biochemistry

Master of Science

Minimum Admission Requirements
• Normally, minimum B+ average in last two years of study in Honours/Specialist BSc program in Biochemistry/Molecular Biology. Students with strong academic credentials in Honours/Specialist programs in disciplines related to Biochemistry/Molecular Biology also considered.
Applicant arranges for personal reference forms from three individuals familiar with academic performance.

Applicants who obtained a degree outside Canada are generally required to have an MSc degree in biochemistry or in a closely related subject area and must arrange for general and biochemistry GRE examination results to be sent to the Department.

Applicants from outside Canada whose primary language is not English and who graduated from a university where the language of instruction was not English must provide TOEFL (Test of English as a Foreign Language) and TWE (Essay Writing) scores.

- Paper-based TOEFL: minimum 580 score and 5 on the TWE.
- Computer-based TOEFL: minimum 237 score and 5 on the essay rating component.
- Internet-based TOEFL: minimum 93/120 score and 22/30 on the writing and speaking sections.

In the absence of TOEFL results, an IELTS score of at least 7 is also acceptable.

Program Requirements

- Complete any courses that were a condition of acceptance.
- Complete BCH2021H Selected Topics in Biochemistry (0.5 FCE) or BCH2024H Focused Topics in Biochemistry (0.5 FCE).
- Participate in BCH 2020Y Master's Seminar Course in Biochemistry.
- Thesis and successful completion of an oral examination on his or her research and related aspects of biochemistry.

Normally, MSc students are expected to participate as full-time students and to maintain full-time status in their laboratories until thesis completion and final defence.

Doctor of Philosophy

Minimum Admission Requirements

- Applicant arranges for personal reference forms from three individuals familiar with academic performance.
- Applicants who obtained a degree outside Canada are generally required to have an MSc degree in biochemistry or in a closely related subject area and must arrange for general and biochemistry GRE examination results to be sent to the Department.
- Applicants from outside Canada whose primary language is not English and who graduated from a university where the language of instruction was not English must provide TOEFL (Test of English as a Foreign Language) and TWE (Essay Writing) scores.

- Paper-based TOEFL: minimum 580 score and 5 on the TWE.
- Computer-based TOEFL: minimum 237 score and 5 on the essay rating component.
- Internet-based TOEFL: minimum 93/120 score and 22/30 on the writing and speaking sections.

- In the absence of TOEFL results, a MELAB score of at least 92 is also acceptable.
- Students accepted into the PhD program through one of three routes:
  1. via reclassification from the MSc program;
  2. on completion of an MSc degree in biochemistry or a cognate discipline;
  3. directly from a BSc if, in the opinion of the Biochemistry Graduate Committee, the student has an outstanding academic record.

- The latter two categories require the student to successfully complete a qualifying examination within the first 18 months.

Program Requirements

- Complete any courses that were a condition of acceptance.
- Complete 1.5 internal or external (from cognate departments) graduate-level courses, including at least BCH2021H Selected Topics in Biochemistry (0.5 FCE), or BCH2024H Focused Topics in Biochemistry (0.5 FCE). Students may take both as part of the 1.5 FCE required courses.
- Participate in BCH 2022Y Doctoral Seminar Course in Biochemistry.
- Submit a thesis and defend it at a School of Graduate Studies oral examination.

- Normally, PhD students are expected to participate as full-time students and to maintain full-time status in their laboratories until thesis completion and final defence.

Courses

For course details and availability, consult the Department's Web site.

BCH 1371H Laboratory Course in Biochemistry (BCH 371)*
BCH 1422H Membrane Proteins: Structure and Function—Lectures (BCH 422H)*
BCH 1426H Regulation of Signalling Pathways—Lectures (BCH 426H)*
BCH 1440H Protein Biosynthesis—Lectures (BCH 440H)*
BCH 1441H Bioinformatics (BCH 441H)*
BCH 1471Y Advanced Biochemistry—Laboratory (BCH 471Y*—prerequisite is BCH 371* or equivalent)
BCH 2020Y Master's Seminar Course in Biochemistry (Credit/No Credit)
BCH 2021H Selected Topics in Biochemistry: Advanced lectures to supplement the above lower-numbered courses in Biochemistry
Fall 2008: Regulation of Cellular Processes by Post-translational Modification
Spring 2009: Recent Advances in Biomolecular Imaging
Fall 2009: Molecular Machines, Biosensors and Nanotechnology
Spring 2010: Protein Interactions: From Principles of Recognition to Drug Design

BCH 2022Y Doctoral Seminar Course in Biochemistry (Credit/No Credit)

BCH 2024H Focused Topics in Biochemistry

JBB 1425H Structural Biology: Principles and Practice—Lectures (BCH 425H)*
JBB 2025H Protein Crystallography—Lectures
JBB 2026H Protein Structure, Folding and Design
JBI 1428H Molecular Immunology—Lectures (JBI 428H)*
JBL 1507H Biochemistry of Inherited Disease
JNP 1017H+ Molecular and Biochemical Basis of Toxicology
JNP 1018H+ Current Topics in Molecular and Biochemical Toxicology
JNR 1444Y Fundamentals of Neuroscience: Cellular and Molecular—Lectures (PSL 444Y)*
JTB 2010H Proteomics and Functional Genomics
JTB 2020H Applied Bioinformatics

* Arts and Science undergraduate course
O Courses which may continue over a program. The course is graded when completed.
+ Extended course. For academic reasons, course work is extended into session following academic session in which course is offered
MOTION
Graduate Education Council
Tuesday, May 19, 2009

ITEM 12.2

Proposal to change the program requirements for the following program:

**Occupational Science and Occupational Therapy, MScOT**
Department of Occupational Science and Occupational Therapy, Faculty of Medicine

**MOTION**

THAT Graduate Education Council approve the proposal of the Faculty of Medicine to change the program requirements of the Occupational Science and Occupational Therapy program to add the course OCT 1100H “Applied Skills and Technology: Human Factors and Design in Occupational Therapy” as a required course for the Master of Science in Occupational Therapy degree. As a result, the overall number of required courses is increasing from 17.5 FCE to 18 FCE. This change is effective retroactive as an exceptional matter to September 2008.

See attached documents:
- SGS Governance Form A
- Calendar Entry

Prior Approvals and Discussion

This proposal brings the program requirements in line with current practice.

The proposal was approved by the Departmental Affairs Committee on August 16, 2007 and by the Graduate Curriculum Committee on October 3, 2007. It was approved by the Faculty of Medicine Faculty Council on April 30, 2009; it was confirmed at the meeting that students currently in the program take OCT 1100H and will be able to fulfill the new requirement.

Further Governance

GEC approval is final. It will be sent for information to the Academic Policy and Programs Committee of Academic Board in SGS’s annual report.
Faculty Affiliation:
Medicine

Name of Graduate Unit:
Occupational Science and Occupational Therapy

Graduate Program/s involved in proposal, if any:
MScOT in Occupational Science and Occupational Therapy

Brief Summary of Proposed Change:
We propose to make the course OCT1100H, Applied Skills and Technology: Human Factors and Design in Occupational Therapy a required course for all students in the M.Sc.O.T. program. This change will increase the overall requirement from 17.5 FCE to 18.0 FCE.

Rationale:
This course will address a current gap in the occupational therapy curriculum by providing students with a cohesive approach to learning about how technology can play a role in their occupational therapy practice. Furthermore, it will also provide an opportunity for students to learn and practice essential hands-on skills that must be used not only in their future practices, but also during their fieldwork placements that are already a part of the curriculum. Some of the materials in this course will come from a number of the existing courses and brought together here to create a more logical grouping of topics. Finally, this course will provide foundation for discussion of topics related to the use of assistive technology and the built environment within other courses in the program.

Prior Approvals/Actions:
Departmental Affairs Committee on August 16, 2007
Approved by Graduate Curriculum Committee October 3, 2007
To be approved Graduate Curriculum Committee 30 April, 2009

Proposed Effective Date:
Retroactive to September 2008, with approval of SGS Vice Dean, Programs

Financial and/or Planning Implications:
None.

Contact Name:
Jill Stier, Graduate Co-ordinator

Submitted by:
Andrea Sass-Kortsak
Vice Dean, Graduate Affairs

Date:
March 27, 2009
Occupational Science and Occupational Therapy  OCT

Faculty Affiliation
Medicine

Degree Programs Offered
Occupational Science and Occupational Therapy- MScOT

Collaborative Programs
The following collaborative programs are available to students in participating degree programs as listed below:
1. Women's Health, see p. 478
   • Occupational Science and Occupational Therapy, MScOT

Overview
The Master of Science in Occupational Therapy program prepares students in advanced academic and professional knowledge and applied research skills for leadership in occupational therapy practice. The program emphasizes the application of theory and research evidence to clinical practice through rigorous studies in occupational therapy and research production and utilization. Graduates are eligible to write the certification examination of the Canadian Association of Occupational Therapists, a requirement for registration with the College of Occupational Therapists of Ontario and most other professional regulatory colleges in Canada. Practice in another country generally requires the graduate to pass the licensing requirement specific to that country. Graduates are eligible to:
1. practice independently in a variety of roles, such as consultants and case managers, and in a range of settings, such as acute care, interdisciplinary programs, private practice, and primary health care,
2. supervise rehabilitation assistants, OT aides, or other support workers,
3. use principles of research-based practice to guide and evaluate service delivery,
4. contribute to research that will advance the knowledge base of the discipline,
5. assume management roles,
6. take leadership roles in the profession,
7. take leadership roles in health care and other sectors including social services, education, and labour,
8. fill academic-practitioner positions, and
9. pursue doctoral studies and careers in academia or clinical research.

Contact and Address
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E-mail: occupational.therapy@utoronto.ca
Telephone: (416) 978-2765
Fax: (416) 946-8570

Department of Occupational Science and Occupational Therapy
University of Toronto
160-500 University Avenue
Toronto, Ontario  M5G 1V7
Canada

Degree Programs
Occupational Science and Occupational Therapy
Master of Science in Occupational Therapy

Minimum Admission Requirements

- Four-year University of Toronto bachelor's degree, or its equivalent from a recognized university, with a minimum mid-B average in the final year. The department will review the last 10 full-course equivalents completed at the undergraduate level by the application deadline.
- Apply ONLINE using the Ontario Rehabilitation Sciences Programs Application Service (ORPAS) at <www.ouac.on.ca/orpas/>. Applications are accepted approximately mid-October each year.
- Applicants whose primary language is not English and who graduated from a university where the language of instruction is not English must provide proof of English facility by the end of April. See Basic English Facility Requirements in this calendar for general information and acceptable tests. The department strongly prefers the Test of English as a Foreign Language (TOEFL) and requires a minimum score of:
  - 600 on the paper-based test, accompanied by a minimum score of 5 on the Test of Written English
  - 250 on the computer-based test, accompanied by a minimum score of 5 on the Test of Written English
  - 100/120 on the Internet-based test with 22/30 on the speaking section and 22/30 on the writing section. TOEFL candidates should request that results be sent to institution code 0982.

Program Requirements

- The MScOT is a two-year, 24-course (18 FCE) program of continuous study.
- Students begin their studies in September and complete six consecutive sessions, with four to six concurrent courses in each session. There are four full-time block fieldwork components within the program of study.

Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>OCT 1100H²</td>
<td>Applied Skills and Technology: Human Factors and Design in Occupational Therapy</td>
</tr>
<tr>
<td>OCT 1111Y</td>
<td>Occupational Science: Foundations for Occupational Therapy</td>
</tr>
<tr>
<td>OCT 1121H</td>
<td>Research Issues and Approaches in Occupational Therapy</td>
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<td>OCT 1122H</td>
<td>Methods in Practice-Based Research</td>
</tr>
<tr>
<td>OCT 1123H</td>
<td>Framing Practice-Based Research</td>
</tr>
<tr>
<td>OCT 1131H</td>
<td>Occupational Therapy Practice I</td>
</tr>
<tr>
<td>OCT 1132H</td>
<td>Occupational Therapy Practice II</td>
</tr>
<tr>
<td>OCT 1133H</td>
<td>Occupational Therapy Practice III</td>
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<tr>
<td>OCT 1141H</td>
<td>Assessment in Occupational Therapy</td>
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<tr>
<td>OCT 1152Y</td>
<td>Musculoskeletal Structure and Function</td>
</tr>
<tr>
<td>OCT 1162Y</td>
<td>Psychosocial Perspectives in Occupational Therapy</td>
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<td>OCT 1172Y*</td>
<td>Neuro-motor/Neuro-cognitive Perspectives in Occupational Therapy</td>
</tr>
<tr>
<td>OCT 1183Y</td>
<td>Occupational Therapy Fieldwork I</td>
</tr>
<tr>
<td>OCT 1190Y*</td>
<td>Building Practice Through Mentorship</td>
</tr>
<tr>
<td>OCT 1220Y²</td>
<td>Graduate Research Project (1.5 FCE)</td>
</tr>
<tr>
<td>OCT 1251H</td>
<td>Enabling Occupation with Children: Part I</td>
</tr>
<tr>
<td>OCT 1252H</td>
<td>Enabling Occupation with Children: Part II</td>
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<tr>
<td>OCT 1261H</td>
<td>Enabling Occupation with Adults: Part I</td>
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<tr>
<td>OCT 1262Y</td>
<td>Enabling Occupation with Adults: Part II</td>
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<td>OCT 1271H</td>
<td>Enabling Occupation with Older Adults: Part I</td>
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<tr>
<td>OCT 1272H</td>
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<td>OCT 1282Y</td>
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</tr>
<tr>
<td>OCT 1283Y</td>
<td>Occupational Therapy Fieldwork IV</td>
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</tbody>
</table>

* Courses which may continue over a program. The course is graded when completed.
+ Extended course. For academic reasons, course work is extended into session following academic session in which course is offered.
MOTION
Graduate Education Council
Tuesday, May 19, 2009

ITEM 12.3

Proposal to change the program requirements for the following program:
Rehabilitation Science (Practice Science field), PhD
Graduate Department of Rehabilitation Science, Faculty of Medicine

MOTION
THAT Graduate Education Council approve the proposal of the Faculty of Medicine,
Graduate Department of Rehabilitation Science, to change the program requirements of the
PhD in Rehabilitation Science to no longer require that students in the Practice Science
field take an additional 0.5 elective FCE. This reduces the overall number of required FCEs
from 4.0 to 3.5 for students in this field only. This change is effective September 2009.

See attached documents:
• SGS Governance Form A
• Calendar Entry

Prior Approvals and Discussion
The proposal was approved by the Graduate Affairs and Appointments Committee on March 10, 2009; this
committee has student representation from the Graduate Department of Rehabilitation Science. It was approved by
the Faculty of Medicine Faculty Council at its meeting on April 30, 2009; no discussion arose at the meeting.

Further Governance
GEC approval is final. It will be sent for information to the Academic Policy and Programs Committee of
Academic Board in SGS’s annual report.
Faculty Affiliation:
Medicine

Name of Graduate Unit:
Graduate Department of Rehabilitation Science

Graduate Program/s involved in proposal, if any:
Ph.D. program of the Practice Science Field

Brief Summary of Proposed Change:
It is proposed that the additional elective course that is currently required for students in the Practice Science Field be dropped. With this change, students would be taking three half-courses (1.5 FCE) above the other fields in the Rehabilitation Science Ph.D. program, courses which were specifically designed for this field. It is assumed that these three extra courses will prepare the students for their thesis research. If students in consultation with their advisors choose to take an additional elective, this is possible, but should not be required. This field is new and is admitting students for September 2009.

Rationale:
The Practice Science field was approved with a requirement of 4.0 FCE. This is more than the requirements for the other Rehabilitation Science Ph.D. fields, each of which require only 2.0 FCE. The Practice Science field operates in a cohort structure where students are also working full-time. As we were developing the course schedule it became apparent that this increased workload is too heavy for this group of students and that the relevant content for this field is covered in the required courses. Thus, we are proposing a requirement for the Practice Science Field of 3.5 FCE, rather than the original 4.0 FCE, by removing the 0.5 FCE elective.

Prior Approvals/Actions:
This proposed change was approved at the Graduate Affairs and Appointments Committee meeting held Tuesday March 10. This committee has student representation from the GDRS.

Proposed Effective Date:
09  2009
Month  Year

Financial and/or Planning Implications:
None

Contact name:
Chair of GDRS: Katherine Berg

Submitted by:
Andrea Sass-Kortsak
Vice Dean Graduate Affairs, Faculty of Medicine

Date:
14 April 2009
Rehabilitation Science  REH

Faculty Affiliation
Medicine

Degree Programs
Rehabilitation Science – MSc, PhD

Overview
Rehabilitation Science is the systematic study of promoting, maintaining or restoring human function, mobility, occupation and well-being. Using basic and applied methods, the science is focused on phenomena at the level of the cell, person, family, community, or society to develop and evaluate theories, models, processes, measures, interventions, practices, and policies to prevent, reverse, or minimize impairments, enable activity, and facilitate participation.

By its very nature, rehabilitation science is multidisciplinary. The Graduate Department of Rehabilitation Science offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy. To capture the full breath of rehabilitation, the expertise of our faculty and the research of our students, Rehabilitation Science has identified five six fields of study:

1. Movement Science
2. Occupational Science
3. Rehabilitation Health Services Studies
4. Rehabilitation Technology Sciences
5. Social and Cognitive Rehabilitation Sciences
6. Practice Science

Collaborative Programs
Students in rehabilitation science may participate in any of the following collaborative programs:
1. Aging, Palliative and Supportive Care Across the Life Course, see p.
   • Rehabilitation Science, MSc, PhD
2. Biomedical Engineering, see p.
   • Rehabilitation Science, MSc, PhD
3. Cardiovascular Sciences, see p.
   • Rehabilitation Science, MSc, PhD
4. Health Care, Technology and Place, see p.
   • Rehabilitation Science, MHSc, MSc, PhD
   • Rehabilitation Science, MSc, PhD
   • Rehabilitation Science, MSc, PhD

Contacts and Address:
Web: www.utoronto.ca/gdrs
E-mail: rehab.science@utoronto.ca
Telephone: (416) 978-0300
Fax: (416) 946-8762
Master of Science

Minimum Admission Requirements

- Four-year University of Toronto BSc degree, or equivalent, with special training in occupational therapy, physical therapy, or a related field, or the equivalent from a recognized university with a B+ average in the final two years of undergraduate study. Related fields might include nursing, psychology, sociology, social work, physical and health education, basic sciences, biomedical engineering, kinesiology, and others.

- Evidence of written and verbal proficiency in English is required for applicants whose first language is not English (see SGS Admissions Standards and Procedures).

Additional admission requirements for the Practice Science Field are listed on the website.

Program Requirements

- Complete course work and a thesis based on the student’s research.

- Successful completion of 2.5 full-course equivalents (FCE) as follows:
  - REH 1100H Theory and Research in Rehabilitation Science
  - REH 2001Y Rehabilitation Presentations and Proceedings
  - 0.5 FCE in research methods
  - 0.5 FCE in a related field of study

- Submission of a thesis and completion of an oral examination of the thesis.

- Minimum of 12 months of full-time study. Students should be aware that the completion of the thesis may take longer.

- Exceptional students may be considered for enrolment in a part-time program. Requirements are the same as for the full-time MSc program with the following exceptions:
  - Residency requirements waived
  - Course work must be completed within two years of initial registration
  - Program must be completed within five years of registration
  - Completion of an annual learning contract and program map

Part-time students should be aware that it is the student's responsibility to modify his or her work schedule to accommodate required course work since course times are not flexible.

Practice Science students complete all the requirements above except for the 0.5 FCE course in a related field of study. Instead, Practice Science students complete REH 2201H Practice Knowledge Translation, REH 2202H Determinants of Practice and REH 2203H Clinical Practicum.

Doctor of Philosophy

Minimum Admission Requirements

- Appropriate University of Toronto MSc degree, or its equivalent from a recognized University with a minimum A- average or a MScOT or MScPT degree with a research component with a minimum of A- standing.

- Well qualified students with excellent research potential holding a BSc degree may be considered for direct admission to the PhD program. These applicants must:
have a minimum A+/A average (GPA 4.0) in an undergraduate program from a recognized university.

- have previous relevant research experience, outstanding references and a personal recommendation from a potential supervisor.

- successfully complete a qualifying examination within the first 18 months of the program.

- Applicants, whose first language is not English, must provide evidence of written and verbal proficiency in English by completing one of the following tests:
  
  - Test of English as a Foreign Language (TOEFL) and the Test of Written English (TWE) with the following minimum scores:
    - Paper-based TOEFL: 600 and 5 on the TWE.
    - Computer-based TOEFL: 250 and 5 on the essay rating component.
    - Internet-based TOEFL: 100/120 and 22/30 on the writing and speaking sections.
  
- Michigan English Language Assessment Battery (MELAB): 87

- International English Language Testing System (IELTS): 7.5

Additional admission requirements for the Practice Science Field are listed on the website.

**Program Requirements**

- A minimum of 1.0 full-course equivalent (FCE) as follows:
  
  - REH 3100H Advanced Rehabilitation Research Issues (if REH1100H has not been completed)
  
  - An advanced research methods course.

- REH 3001Y Advanced Rehabilitation Presentation and Proceedings.

- A written and oral comprehensive examination.

- Complete and defend a thesis.

- The PhD program emphasizes research work. Students may be required to take extra courses in addition to the degree requirements listed above.

- Students are expected to be on campus and participating full time until all program requirements are completed.

In addition to the requirements listed above, Practice Science students will complete REH 3301H Practice: Knowledge Translation, REH3302H Determinants of Practice and REH2203H Clinical Practicum.

**Courses**

Since not all courses are offered each academic year, the department should be consulted each session as to course offerings.

REH 1100H Theory and Research in Rehabilitation Science
REH 1120H Research Methods for Rehabilitation Science
REH 1130H Theory and Research in Occupational Science
REH 1510H Disordered and Restorative Motor Control
REH 1820H Methodological Issues in Research on Aging and Health
REH 2000H Individual Reading and Research Course
REH 2001Y Rehabilitation Presentations and Proceedings (Credit/No Credit)
REH 3001Y Advanced Rehabilitation Presentation and Proceedings (Credit/No Credit)
REH 3100H Advanced Rehabilitation Research Issues (Credit/No Credit)
REH 2201H/3301H Practice: Knowledge Translation (TBA)
REH 2202H/3302H – Determinants of Practice (TBA)
REH 2203H Clinical Practicum (TBA)

*Courses which may continue over a program. The course is credited when completed.*
Graduate Faculty

Full Members
Anne Agur - BSc, MSc, PhD
Elizabeth Badley - BSc, MSc, DPhil, PhD
Katherine Berg - BPT, BScPT, MSc, PhD
Sandra Black - BSc, MD
Kathryn Ann Boschen - BA, MA, PhD
Dina Brooks - BSc(PT), MSc, PhD (Coordinator of Graduate Studies)
Heather Carnahan - BPE, MSc, PhD
Anne Carswell - Dip(OT), BSc, MSc, PhD
Tom Chau - BASc, MSc, PhD
Angela Colantonio - BA, BSc, MSc, PhD
Cheryl Cott - Dip(P&OT), BPT, DipGer, MSc, PhD
Aileen Davis - BSc(PT), MSc, PhD
Geoffrey Fernie - BSc, PhD, PEng, CCE
John Frank - BSc, MD, CCFP, MSc, FRCP(C)
Michael Iwama - BSc, BSc(OT), MSc, PhD
Susan Jaglal - BSc, MSc, PhD
Bonnie Kirsh - BSc(OT), MEd, PhD
William McIlroy - BSc, MSc, PhD (Adjunct)
Alex Mhilaidis - BASc, MSc, PhD, PEng
Morris Milner - BSc, PhD
Cameron Mustard - AB, ScD
Helene Polatajko-Howell - BOT, MEd, PhD, OT(C) (Chair)
Milos Popovic - MSc, MAsc, PhD
Susan Rappolt - BSc(OT), MSc, PhD
Denise Reid - BSc(OT), MEd, PhD
Rebecca Renwick - DIP (P&OT), BA, PhD
David Streiner - BA, MS, PhD, CPsych
Donald Stuss - BA, BPh, MA, PhD, University Professor
Scott Thomas - BSc, MSc, PhD
Mary (Molly) Verrier - DipP&OT, MHSs
Karen Yoshida - BPhE, BSc(PT), MSc, PhD
Nancy Young - BSc(PT), MSc, PhD (Adjunct)

Members Emeriti
Judith Friedland - BA, Dip(P&OT), MA, PhD

Associate Members
Dorcas Beaton - BSc(OT), MSc, PhD
Debra Cameron - BSc(OT), MEd, PhD
Jill Cameron - BSc, MSc, PhD
Kent Campbell - BSc, PhD
Paul Comper - BA, MA, PhD, C Psych
Deirdre Dawson - BSc, MSc, PhD
Barbara Gibson - BMR(PT), MSc, PhD
Roger Goldstein - MB, ChB, MRCP, FRCP(C), FCCP
Sherry Grace - BA MA PhD
Chantal Graveline - BSc(PT), MSc, PhD
Robin Green – BA, PhD, CPych
Michelle Keightley - BSc, MA, PhD
Clifford Klein - BA, MA, PhD
Michel Landry - BSc(PT), MSc(PT), PhD
ITEM 14.1

Graduate Education Council: Spring 2009 Election Report

See attached documents:

• Graduate Education Council: Spring 2009 Election Report
There were seventeen positions on Graduate Education Council open for election in the spring of 2009. A call for nominations was made in February. Balloting closed on April 27, 2009. Eleven positions were filled by acclamation. An election by secret ballot was held to decide the representatives in one constituency: faculty from Division IV, the Life Sciences. The Election Committee met on May 7, 2009 and determined the results.

**Faculty Constituencies**

<table>
<thead>
<tr>
<th>Division</th>
<th>Nominations</th>
<th>Graduate Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1—Humanities</td>
<td>Charlie Keil [acclaimed]</td>
<td>History</td>
</tr>
<tr>
<td>(1 faculty vacancy)</td>
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<tr>
<td>2—Social Sciences</td>
<td>Elizabeth Campbell [acclaimed]</td>
<td>Curriculum, Teaching &amp; Learning</td>
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<tr>
<td>(2 faculty vacancies)</td>
<td>Andrea Litvack [acclaimed]</td>
<td>Social Work</td>
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<tr>
<td>3—Physical Sciences</td>
<td>Vladimiros Papangelakis [acclaimed]</td>
<td>Chemical Engineering &amp; Applied Chemistry</td>
</tr>
<tr>
<td>(2 faculty vacancies)</td>
<td>[VACANT]</td>
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<tr>
<td>4—Life Sciences</td>
<td>Luc de Nil (Chair) [acclaimed]</td>
<td>Speech-Language Pathology</td>
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<td>(1 Chair vacancy)</td>
<td>Malcolm Campbell [elected]</td>
<td>Cell &amp; Systems Biology</td>
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<tr>
<td>(2 faculty vacancies: ELECTION)</td>
<td>Howard Mount [elected]</td>
<td>Medical Science, Institute of</td>
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<tr>
<td></td>
<td>Tammy Sage [not elected]</td>
<td>Ecology &amp; Evolutional Biology</td>
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**Student Constituencies**

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<tr>
<th>Division</th>
<th>Nominations</th>
<th>Graduate Unit</th>
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<tbody>
<tr>
<td>1—Humanities</td>
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<td>[VACANT]</td>
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<tr>
<td>2—Social Sciences</td>
<td>Bryan GoPaul [acclaimed]**</td>
<td>Theory &amp; Policy Studies in Education</td>
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<td>[VACANT]</td>
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<td>3—Physical Sciences</td>
<td>Jason Grenier [acclaimed]*</td>
<td>Electrical &amp; Computer Engineering</td>
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<td>(2 vacancies)</td>
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<td>[VACANT]</td>
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<tr>
<td>4—Life Sciences</td>
<td>Christopher Klinger [acclaimed]*</td>
<td>Health Policy, Management &amp; Evaluation</td>
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<tr>
<td>(2 vacancies)</td>
<td>David Piccin [acclaimed]**</td>
<td>Medical Science, Institute of</td>
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**Administrative Staff Constituencies**

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<th>Division</th>
<th>Nominations</th>
<th>Graduate Unit</th>
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</thead>
<tbody>
<tr>
<td>Graduate Units</td>
<td>Rose Ann MacGillivray [acclaimed]**</td>
<td>Law</td>
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<tr>
<td>SGS</td>
<td>Arianna Capotorto [acclaimed]**</td>
<td>Graduate Studies, School of</td>
</tr>
<tr>
<td>(1 vacancy)</td>
<td></td>
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</tr>
</tbody>
</table>

**Terms of office:**

Faculty serve a three year, non-renewable term of office. Students and administrative staff have the option of a one (*) or two (**) year term of office, to a maximum of three consecutive years.

**Election Committee:**

The Election Committee consisted of Prof. Jens-Erik Mai, Division II faculty member of Graduate Education Council; Prof. Berry Smith, SGS Vice-Dean, Students; Mr. Anil Purandaré, SGS Governance Officer; and Ms. Jane Alderdice, Secretary of Graduate Education Council and Chief Election Returning Officer.
A total of approximately 1,400 Division IV, faculty members were eligible to vote. A total of 60 ballots were received. Of these, 58 were considered valid.

A by-election will be held in September 2009 to fill four vacant seats:

- Division I, Student 1 vacant seat
- Division II, Student 1 vacant seat
- Division III, Faculty 1 vacant seat
- Division III, Student 1 vacant seat
FOR INFORMATION
Graduate Education Council
Tuesday, May 19, 2009

ITEM 14.2

Mathematical Finance (MMF): Administrative Transfer of Program from SGS to the Faculty of Arts and Science

In the academic year 2007-2008, a review of the Mathematical Finance (MMF) program was conducted with external consultants. The review recommended the relocation of the program from the School of Graduate Studies (SGS) to one of its cognate Faculties. After consultation between SGS and the Faculty of Arts and Science, a decision was made to transfer the program to the Faculty of Arts and Science, effective July 1, 2009.

Faculty, staff and students have been duly advised of the impending transfer. The transfer will not have an impact on the delivery of the program.