



School of Graduate Studies

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October 15, 2008

To : Faculty of Health Sciences Graduate Policy and Curriculum Committee

From : Medy Espiritu *Medy Espiritu*
Assistant Secretary and SynApps System Administrator

The next meeting of the Faculty of Health Sciences Graduate Policy and Curriculum Committee will be held on **Monday, October 20, 2008 at 2:00 p.m.** in **MDCL-3024**.

Listed below are the agenda items for discussion.

If you are unable to attend this meeting, please call extension 24204 or email espiritu@mcmaster.ca.

A G E N D A

- I. Minutes of the meeting of June 10, 2008
- II. Associate Dean's Report
- III. M.Sc. in Global Health (Dr. N. Archer)
- IV. M.Sc. in Health Management (Dr. M. Law)
- V. Nursing
 - New Field – Advance Practice Nursing (Dr. E. Staples)
 - Change of Current Field: From *Leadership and Practice* to *Leadership* (Dr. E. Staples)
- VI. New Course – Health Research Methodology
 - *728 - Clinical Epidemiology & Biostatistics Genetics
- VII. Course Cancellation – Medical Sciences
 - *760 – Principles of Pre-clinical and Drug Discovery
- VIII. Graduate Faculty Participation (*for information*)
- IX. Other Business

**FACULTY OF HEALTH SCIENCES GRADUATE POLICY AND CURRICULUM
COMMITTEE**

JUNE 10, 2008, 1:30 P.M.

MUMC-3N5A

PRESENT: Dr. C. Richards (Chair), Dr. K. Bennett, Dr. M. Black, Mr. P. De Ciantis, Mr. J. Hernandez, Dr. B. Lichty, Ms. K. McCahill-Harrison, Dr. J. Nodwell, Dr. L. Schwartz, Dr. M. Stampfli, Dr. L. Wishart, Mrs. M. Espiritu (Assistant Secretary)

REGRETS: Dr. P. Baxter, Mr. J. Scime, Dr. P. Solomon, Dr. S. Wilkins

I. ASSOCIATE DEAN'S REPORT

Dr. Richards reported that the search for the Associate Vice-President and Dean of the School of Graduate Studies is still ongoing. He said that in 3-4 weeks' time, the search committee might announce the successful candidate. Dr. Richards said he expects substantial changes in the structure of the School of Graduate Studies, in particular, more responsibilities for the Associate Deans. He added that changes in the sub-committees of Graduate Council, i.e., curriculum and policy committee, will also take place.

The members made the following comments/suggestions:

- the functions of the Faculty of Health Sciences Graduate Policy and Curriculum Committee should be refined
- compilation of data for the assessment of the different programs over X number of years would be useful, i.e., information to improve the quality of education
- criteria of time to completion; percent of external scholarships awarded; number of students from other programs enrolled for the last five years in Health Sciences courses
- efficient system to monitor scholarships, especially external scholarships; database of students who were awarded scholarships; improve mentorship for various scholarships
- trend of the GPA should be monitored; the information should also include ways of assessing whether or not the student is at risk of withdrawing

Dr. Richards also discussed the issue of OCGS changing its mandate. He explained that in the future, OCGS will no longer conduct periodic appraisals; and that this task will be done internally (within universities). In the case of McMaster, the Provost and the new Associate Vice-President and Dean of Graduate Studies will deal with a seven-year reappraisal of programs.

II. CURRICULUM REVISIONS 2008-2009

Medical Sciences

Dr. Stampfli reviewed the new course, *720 – Tobacco and Health: From Cells to Society, proposed by the Medical Sciences program. He explained that this course will provide students with a comprehensive overview of tobacco and tobacco-related issues from a public health perspective. He said that students in this course will be exposed to experts in the field from different institutions in Canada through video conferencing. He stated that the topics will include epidemiology, nicotine addiction, genetic factors, health effects from the tissue level to the cell, treatment issues, and public health policy.

Dr. Stampfli moved, and Dr. Schwartz seconded,

“that the Faculty of Health Sciences Graduate Policy and Curriculum Committee approve, for recommendation to the Faculty of Health Sciences Executive Committee, the new course *720 – Tobacco and Health: From Cells to Society.”

After a brief discussion, there was a suggestion to inform students that the cost for the video conference would be borne by the department. Another suggestion was to add “permission of the instructor” in the prerequisite. One member commented that the committee should have invited the instructor to the meeting, so he could discuss further the models, approach, and pedagogy of the course, and the type of students who would benefit from such a course. Dr. Richards said he will email the instructor to request for more course information.

The motion was carried.

Dr. Stampfli said the program is also proposing to cancel MS *6II3 – Advanced Topics in Immunology. Since Master’s students in the program no longer benefit from 600-level courses, the department decided to cancel the course.

Dr. Stampfli moved, and Dr. Schwartz seconded,

“that the Faculty of Health Sciences Graduate Policy and Curriculum Committee approve, for recommendation to the Faculty of Health Sciences Executive Committee, the cancellation of MS *6II3 – Advanced Topics in Immunology.”

The motion was carried.

Nursing

Dr. Black explained that the Nursing program is proposing to change the procedure of transferring from the M.Sc. to the Ph.D. program. Dr. Black explained that the new procedure will require the student to complete three courses (NUR *701, HRM *721, HRM/NUR *745) in addition to NUR *709 in the case of thesis-based students and an elective in the case of course-based students. She said the transfer process could be initiated by the student after 12 months

and before 18 months in the program. She explained that the student would submit a letter providing justifications for the transfer, write a three-page statement describing the proposed Ph.D. research project, produce evidence of scholarly productivity, and obtain two letters of reference from faculty members familiar with the student's work.

There was a comment suggesting that the student has to present the proposed research project and answer questions. Dr. Richards said Master's students in the Medical Sciences program who wish to transfer to the Ph.D. are required to present their research proposal. However, if the Nursing program believes that there is enough information in the package, then perhaps the oral presentation is not necessary.

After the discussion, it was decided that the Nursing program provide the curriculum committee with a written statement justifying that the oral presentation is not necessary. The documents submitted by the student have sufficient information to initiate the transfer.

Dr. Black moved, and Dr. Stampfli seconded,

“that the Faculty of Health Sciences Graduate Policy and Curriculum Committee *approve in principle*, the proposed change in the procedure for transferring from M.Sc. to the Ph.D. program.”

The motion was **carried**.

Dr. Black said the Nursing program also recommended a change in course number for *6H03 to *728 – Health Issues in International and Intercultural Health. Dr. Black explained that *6H03 used to be taught in conjunction with the undergraduate course. The program decided to offer the course separately as a 700-level course. Dr. Black added that there is also a minor change in the method of evaluation for the course.

Dr. Black moved, and Dr. Schwartz seconded,

“that the Faculty of Health Sciences Graduate Policy and Curriculum Committee approve, for recommendation to the Faculty of Health Sciences Executive Committee, the change in course number for *6H03 to *728 – Health Issues in International and Intercultural Health, as described in the document.”

The motion was **carried**.

Dr. Black also presented the following new courses proposed by the School of Nursing:

- *761 – Pathophysiology for NPS
- *762 – Advanced Health Assessment and Diagnosis I
- *763 – Advanced Health Assessment and Diagnosis II
- *764 – Therapeutics in Primary Health Care I
- *765 – Therapeutics in Primary Health Care II

*766 – Roles and Responsibilities

*767 – Integrative Practicum

The above are required courses for the Primary Health Care Nurse Practitioners program.

Dr. Black moved, and Dr. Stampfli seconded,

“that the Faculty of Health Sciences Graduate Policy and Curriculum Committee approve, for recommendation to the Faculty of Health Sciences Executive Committee, the new Nursing courses *761, *762, *763, *764, *765, *766, *767, as described in the documents.”

The motion was carried.

III. OTHER BUSINESS

Dr. Richards presented the following items to the committee for information:

- 1) Graduate Faculty Participation for Health Research Methodology, Rehabilitation Sciences, Occupational Therapy, and Physiotherapy programs.
- 2) Committee Membership List – Graduate Programs in Health Sciences as of July 1, 2008

There was no other business and the meeting adjourned at 3:10 p.m.

PROPOSED GLOBAL HEALTH M.SC. PROGRAM

October 14, 2008

1. Introduction

Global Health can be defined as health problems, issues, and concerns that transcend national boundaries, they may be influenced by circumstances or experiences in other countries, and are best addressed by internationally cooperative actions and solutions. But Global Health is not just about health. It also includes considerations of the critical relationships among health, healthcare, sanitation, education, economic development, and business leadership and management.

Preparing students for a career that addresses the range of interrelated issues in Global Health requires a rounded interdisciplinary program involving courses and seminars in the global nature of the problems faced by underdeveloped and developing nations and indeed by developed nations. This will be provided to graduate students through a collaborative program between McMaster University and Maastricht University, giving our students an understanding of Global Health, in addition to the opportunity of becoming more specialized in one of the three program fields: Globalization and Development, Global Health Management, and Global Diseases.

This program will lead to the degree Master of Science in Global Health. This degree will be granted by either McMaster or Maastricht, with appropriate notation in the related transcripts to indicate that it is a collaborative degree program between the two universities. The program will involve collaboration among the Faculty of Health Sciences, the DeGroote School of Business, and the Faculty of Social Sciences at McMaster University, and the Faculty of Health, Medicine, and Life Sciences at Maastricht University in The Netherlands.

Maastricht University is one of Europe's most international universities, with non-Dutch students accounting for 45% of its aggregate intake. The vast majority of its 16 bachelor level degrees and almost all of its master's and Ph.D. degree programs are taught in English. Maastricht has headed the Dutch university league tables for many years, and it placed 111th in this year's annual ranking of the world's top 200 universities by the UK's *Times Higher Education Supplement* (McMaster placed 117th).

We expect to admit the first students to the program in September 2009. Only full time students will be considered. This is a one year Master's, and will be a terminal degree for most McMaster students, except for a relatively small number who may choose to complete a thesis and go on to Ph.D. studies. A thesis would extend the program's length for as much as two extra terms for McMaster students. McMaster's steady state target is 25 students entering each Fall, with as many as 20% thesis students and the remainder course-project. We anticipate no more than 20% of McMaster students to be visa students. Maastricht has a steady state target of 50 students, and they expect all their students to complete a Master's thesis within one year.

1.1 Objectives

The objectives of this program are:

- 1) To give students a solid foundation and understanding of the main issues in global health.
- 2) To provide a significant exchange of ideas and knowledge through interactions among students and faculty at McMaster and Maastricht Universities that will enrich student experience and learning, either

through physical exchanges of students and faculty or interaction through online sharing of courses and seminars

3) To give students an opportunity to specialize in one of the three pillars of the Global Health program: Globalization and Development, Global Health Management, and Global Diseases.

4) To give students an opportunity to understand and potentially to experience at first hand the interrelated health, environmental, educational, and economic challenges faced by populations in under-developed and developing countries.

The three fields in the program are:

a) Globalization and Development

Globalization focuses on cultural, political, social and economic globalizing processes in the contemporary era and how they impact economic development, health, healthcare, and education in underdeveloped and developing countries. These processes, often accelerated by information and communication technologies, have redefined in unequal ways how individuals and communities experience and view the world, and how they organize to change the world.

b) Global Health Management

Global Health Management introduces students to management and policy skills, including a fundamental understanding of the capacities needed to manage projects related to health, healthcare, economic development, and education.

c) Global Diseases

The Global Diseases field involves the study of endemic tropical diseases as well as other diseases that tend to afflict under-developed countries, including HIV/AIDS, tuberculosis, and cancer. A globalization topic that will be emphasized is the threat to public health from existing, new, and re-emerging diseases that may move almost with impunity across national borders through immigration, travel, and global trade. Chronic diseases that affect developed nations are also becoming a threat to health in developing nations, and will be addressed as well.

The fields of study in the program are not mutually exclusive, and students will choose from a wide spectrum of research interests that cross the rather fuzzy boundaries that define the fields. To encourage this cross-fertilization, all students will take the core courses Global Health Foundations I and Global Health Foundations II that bridge the fields. They will also attend the required joint seminars that address a variety of issues in Global Health. In addition they will choose fields, electives and do scholarly projects in areas of special individual interest, to enable them to build upon and advance their knowledge of Global Health in a manner that will often cross field boundaries. Finally, the student cohorts from both McMaster and Maastricht will attend Global Health 710, a joint Learning Symposium and Field Orientation, that will feature seminars by experts in the field, student presentations on selected research topics, and (where feasible) field visits to sites that involve development activities in global health relevant to the program.

2. Faculty

The faculty members from the three McMaster faculties are all highly qualified instructors and researchers. They are listed in Table 1. Some of the faculty members in this listing are near the beginning of their academic careers, and consequently have not had significant supervisory experience. However, these faculty members have typically gained experience through service on

graduate student supervisory committees. In addition, some of the Business faculty members are in an Area (Strategic Market Leadership and Health Service Management) which offers an MBA but does not currently offer an M.Sc. or Ph.D. degree. However, they are all extensively involved in research activities. They also teach MBA classes where they frequently supervise MBA term research papers and projects (not listed here).

2.1 Commitment of Faculty Members From Maastricht University

Commitment to this collaboration by the two universities is reflected in a Memorandum of Understanding that will be signed by officials at both universities. There are several ways in which this collaboration will enhance the program:

- There are two required Global Health Foundations I and II courses that will be taught sequentially in the two teaching terms. These will be jointly offered online by faculty members at both universities, and will include a number of special seminars by experts in the field from around the world.
- The Winter term will feature the possibility of student exchanges that will greatly increase the cross-fertilization of learning from faculty and among students
- The learning symposium and field orientation that all students from both universities will physically attend after the end of the Winter term will be organized, coordinated, and supervised through a collaboration by faculty and staff of both universities

All of the Maastricht educational units are within the Maastricht Faculty of Health, Medicine, and Life Sciences. Dr. Maria Stuttaford is a Maastricht faculty member from the Department of International Health who will participate directly in instructing McMaster students while they are at McMaster, through the online jointly offered Global Health Foundations I and II courses. As a consequence, she will be appointed as an adjunct part-time assistant professor at McMaster.

3. Program Considerations

3.1 Space

It is highly desirable for the students in the M.Sc. Global Health program to be located physically in a contiguous area. This encourages student interaction and cross fertilization from the diverse group of students that are expected to enter the program. Office/carrel space is not normally provided to graduate students pursuing the course-project option. The program requires office space for graduate students taking the thesis option (estimated at five students in steady state), administrators, and ready access to classrooms and seminar rooms. The graduate student study room in HSC 4N70 includes a total of 1500 square feet. It is accessible by graduate students in Nursing and Medical Sciences and includes 36 study carrels, 3 computers, and wireless Internet access. This space will be available for use by M.Sc. Global Health thesis students.

TABLE 1. McMaster Faculty Associated With The Global Health Program

Faculty Name & Rank	M/F	Ret. Date	Home Unit ²	Supervisory Privileges	Field/Expertise ¹			
					1	2	3	4
Category 1								
Andrea Baumann (Prof.)	F	N/A	Int. Health, Nursing	Full	X	X		
Category 3								
Noori Akhtar-Danesh (Assoc)	M	N/A	Nursing	Full				X
Vishwanath Baba (Prof.)	M	N/A	HRM	Full	X	x		
Kevin Brazil (Prof.)	M	N/A	CE&B	Full	x	X		
Jonathan Bramson (Assoc)	M	N/A	PMM, CGT	Full			X	
Will Coleman (Prof.)	M	N/A	Pol. Science, IGHC	Full	x	X		
Deborah Cook (Prof.)	F	N/A	Medicine, CE&B	Full				X
Gordon Guyatt (Prof.)	M	N/A	CE&B, Medicine	Full				X
Bonny Ibhawoh (Assoc.)	F	N/A	History, IGHC	Full		X		
Susan Jack (Assist.)	F	N/A	Nursing	Full				X
Padman Jayaratne (Assoc)	M	N/A	PMM	Full			X	
Paul Krueger (Assoc.)	M	N/A	CE&B	Full		x	X	
John Lavis (Assoc.)	M	N/A	CE&B, CHEPA, PPD	Full		X		
Mark Levine (Prof.)	M	N/A	CE&B, Oncology	Full			x	X
Mark Loeb (Prof.)	M	N/A	PMM, CE&B	Full			X	
Chris Longo (Assist.)	M	N/A	HSM	Full	X	x		
Ann McKibbin (Assoc.)	F	N/A	CE&B, HIRU	Full		X		
Geoffrey Norman (Prof.)	M	N/A	CE&B	Full				X
Robert O'Brien (Prof.)	M	N/A	Pol. Science, IGHC	Full		X		
Tony Porter (Prof.)	M	N/A	Pol. Science, IGHC	Full		X		
David Price (Assoc.)	M	N/A	Family Medicine	Full			X	
Parminder Raina (Prof.)	M	N/A	CE&B, EPC, PHRI	Full			X	x
Glen Randall (Assist.)	M	N/A	SML & HSM	Full	X	x		
Aaron Schat (Assist.)	M	N/A	HRM	Full	X			
Ruta Valaitis (Assoc.)	F	N/A	Nursing	Full			x	X
Patricia Wakefield (Assist.)	F	N/A	SML&HSM	Full	X	x		
Yonghong Wan (Assoc.)	M	N/A	PMM, CGT	Full			X	
Zhou Xing (Prof.)	M	N/A	PMM, CGT	Full			X	
Toru Yoshikawa (Prof.)	M	N/A	SML&HSM	Full	X	x		
Rachel Zhou (Assist.)	F	N/A	Social Work, IGHC	Full		X		
Category 5								
Daniel Drache (Prof.)	M	N/A	Pol. Sci. (York U.)	Co-Sup		X		
Category 6								
Mahshid Dehghan	F	N/A	PHRI, Medicine	Co-Sup			x	X

1 Field/Expertise: 1 – Global Health Management; 2 – Globalization & Development; 3 – Global Diseases; 4 (Expertise) – Epidemiology

2 CE&B – Clinical Epidemiology & Biostatistics; CEM – Centre for Evaluation of Medicine; CGT – Centre for Gene Therapeutics; CHEPA – Centre for Health Economics & Policy Analysis; EPC – Evidence Based Practice Centre; HIRU – Health Information Research Unit*; HSM – Health Service Management; HRM – Human Resources Management; IGHC – Institute on Globalization & the Human Condition; SML – Strategic Market Leadership; PPD – Program in Policy Decision Making; PHRI – Population Health Research Institute; PMM – Pathology & Molecular Medicine.

Category 1: Tenured or tenure-track core faculty members whose graduate involvement is exclusively in the graduate program under review. For this purpose the master's and doctoral streams of a program are considered as a single program. Membership in the graduate program, not the home unit, is the defining issue.

Category 3: Tenured or tenure-track core faculty members who are involved in teaching and/or supervision in other graduate program(s) in addition to being a core member of the graduate program under review.

Category 5: Other core faculty: adjunct professor appointment.

Category 6: Non-core faculty who participate in the teaching of graduate courses.

3.2 Financial Support for Global Health Graduate Students

Graduate student stipends will be provided following practices adapted from existing graduate programs in the three participating faculties. Part time enrolment in this program is not allowed. Students will be encouraged to apply for relevant external scholarships including CIHR, SSHRC, OGS, and OGSST. Current scholarships levels for M.Sc. students are: CIHR CGS (\$17,500), SSHRC CGS (\$17,500), OGS (\$15,000), and OGSST (\$15,000).

For students without external scholarships, typical stipends for M.Sc. (thesis option) students in Health Sciences at McMaster currently total \$19,400. These include half Teaching Assistantships (currently \$4,940), Faculty of Graduate Studies scholarship awards of \$3,000, and additional support from research grants for thesis students, at the discretion of their supervisors. Thesis students who go on exchange are not eligible for Teaching Assistantship funds. Course-project students receive Faculty of Graduate Studies scholarships of \$3,000, but no TA funds. All students may apply for a limited number of travel scholarships of \$2000 per year which will be awarded on merit. Students must use these scholarships on travel related to scheduled program activities (e.g. student exchange at Maastricht University). Visa students normally receive a tuition bursary which covers the visa student/Canadian student fee differential. The Global Health Master's program is nominally a 12 month program, although thesis option students are likely to take longer to complete and submit their theses. However, McMaster University puts time limits on funding of 24 months for Master's students.

Students will pay tuition according to the schedule for Master's programs established by the School of Graduate Studies. For students beginning their programs in the 2008-09 year, annual tuition fees are currently \$5,154 for Canadians and landed immigrants, and \$12,525 for visa students.

4. Program Regulations

The Global Health program and courses will be overseen at McMaster by a Co-Director who will work closely with the corresponding Co-Director at Maastricht. The McMaster Co-Director will report to the Deans of the Faculty of Health Sciences, Faculty of Social Sciences, and the DeGroote School of Business. Any changes to the McMaster curriculum will be approved through the respective Graduate Curriculum Committees at McMaster, the McMaster Graduate Council, and the Senate, depending on the nature of the changes.

4.1 McMaster Admission Requirements

To be considered for admission to the M.Sc. Global Health program, an applicant must have:

- An Honours bachelor's degree with at least a B+ from an accredited university (equivalent to a McMaster 8.5 GPA out of 12) in the final year in all courses in the discipline, or relating to the discipline, in which the applicant proposes to do graduate work.
- A strong interest in one or more of the three fields offered in the program.
- One official transcript of academic work completed to date at all post-secondary institutions attended, sent directly from the issuing institution(s). If the final transcript does not show that a completed degree has been conferred, an official copy of the diploma is also required.
- All students entering the program must have completed a university level course in statistical analysis with a minimum grade of B-
- Students with no background in health may be required to complete a makeup course in health before entering the program
- Two confidential letters of recommendation from instructors most familiar with the applicant's academic work, sent directly from the instructors.
- A personal Curriculum Vitae (résumé)
- A written personal essay that explains why the applicant is seeking graduate education and describing how the applicant plans to benefit from the program (no more than 750 words)
- If English is not the applicant's native language, an official copy of the applicant's TOEFL Test of English as a Foreign Language score or other evidence of competency in English must be submitted; A minimum TOEFL (iBT) score of 92 (550 on the paper-based TOEFL or 237 on the computer-based test) is required.
- A maximum of 25 students will be admitted each year at McMaster and 50 at Maastricht, for classes beginning each September. Student exchanges between the universities will be possible during the Winter term, but numbers will be balanced as closely as possible so that the same numbers of students will be on exchange from each university.

4.2 McMaster Program Requirements

In order to graduate, a McMaster student is required to complete successfully:

- the five required half-courses
- the Learning Symposium and Field Orientation
- a research proposal developed under the direction of a supervisor
- Thesis students must also complete
 - one half-course chosen from the selected field of study (or the three required Winter term modules at Maastricht if electing to exchange)
 - a thesis on a topic in the student's chosen field of interest.
- Course-project students must also complete
 - two courses chosen from the selected field of study and one course chosen from the list of electives (or the three required Winter term modules at Maastricht if electing to exchange),
 - a major research paper on a topic in the student's chosen field of interest

4.3 Student Supervision

Each student will have a supervisory committee of two faculty members. One will be the student's supervisor (or an advisor in the case of course-project students), and the second member will be, if possible, from the university that is not the supervisor's/advisor's. Student supervisor/advisor

assignments will be based on the field chosen by the students. It may be possible but unusual for a Maastricht student to have a McMaster supervisor/advisor, and vice versa. This distribution of supervisory responsibilities between the universities will ensure a more uniform supervision and evaluation of the students. It will also ensure that the student's home university's policies on independent studies and scholarly research papers will be followed.

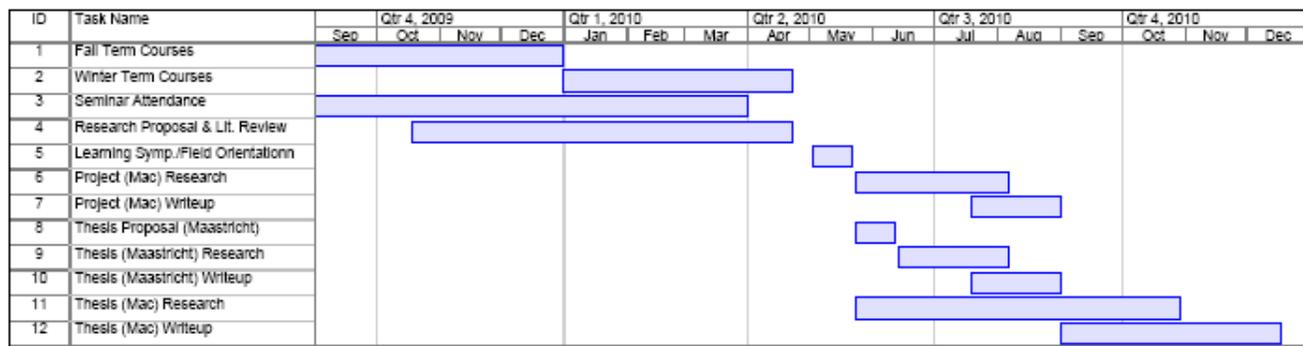
4.4 Distance Delivery

The joint courses and perhaps some of the other courses will be offered through distance education, utilizing systems that offer live presentations through the Internet, such as Elluminate® and/or support systems that provide access to online files and presentations, such as Blackboard®. This will enhance remote course sharing between the two universities to increase cross-fertilization of ideas among students and faculty members.

4.5 Program Format

The program will be 12 months in duration and will consist of three terms, except for McMaster students taking the thesis option (this may extend the program duration to four and a maximum of five terms). Figure 1 is a Gantt chart showing a suggested timeline for the student cohort entering the program in September 2009. There are several differences among the schedules for Maastricht and McMaster students, and there is a difference between the schedules for McMaster course-project and thesis students. These are reflected in the schedules shown on the Gantt chart.

Figure 1. Timeline for Student Progress: Cohort Entering September 2009



The sequencing of the program will proceed as follows at McMaster and Maastricht.

1. Fall term (September – December)

Students will take the first term at their “home” institution. McMaster students will take a bundle of three parallel required courses. Students at Maastricht will complete a required group of program modules. In addition, students at both institutions will work in intercontinental teams on overarching assignments in the required course “Global Health Foundations I”.

2. Winter/Spring term (January – April)

The program is designed to optimize student exchange between the two institutions. Because of the different organizational structures and educational approaches at the two institutions (the Maastricht

program consists exclusively of consecutive full time problem-based modules, while McMaster bundles 13 week courses), student exchange is concentrated in the second term.

During this term students will have the opportunity to travel to the other institution for the full term. Thus, students can choose to complement the orientation of their home institution with that of the sister institution or they can decide to stay “home” to expand their original orientation. Students at both institutions will take the required course “Global Health Foundations II”, working in intercontinental teams on overarching assignments. During this period course-project students at McMaster will also choose two courses from their selected field of interest plus one course from the elective group of courses. McMaster courses available during the Winter term are listed in Table 2, and their descriptions appear in Appendix 1. Thesis students will take one course from the field of their choice. Maastricht offers three consecutive five week modules that all students at Maastricht will take, and the descriptions of these modules appear in Appendix 2. Students at Maastricht will also have the opportunity to further their knowledge of methodology and statistics.

At the end of the Winter term (April) GH 710, a 2-3 week Learning Symposium and Field Orientation will be scheduled for all students of both institutions. The purpose of this symposium is to further exchange and unify perspectives. For example, students will present their research proposals in order to obtain a critical review and feedback, so they can further refine their proposals. The symposium will alternate annually between Hamilton and Maastricht, or preferably on site in a developing or underdeveloped country where students will be able to experience a real environment appropriate to their studies. The selection of an external venue will depend entirely on the availability of outside funding to support the learning symposium. If outside funding is not available, the symposium will be held at one of the universities, to limit travel movements and costs since some students will not have to travel to get to the meeting site.

3. Summer term (May – August)

During this term students return to their home institutions.

Students at *McMaster* are expected to have completed the development of a research proposal, including a literature review by the end of the winter term. Indeed, thesis students may have already completed their proposals and begun their research projects, since their course load in the winter term is limited to one required and one elective course. Upon return to their home institution, McMaster course-project option students will proceed to complete a major research paper, relevant to the field they selected, during the remainder of the summer. This may involve the collection or analysis of empirical data or it may involve a model or conceptual design based on a literature review undertaken prior to the workshop. The scholarly study will be submitted as the student’s Master’s project and may in some cases be suitable for publication in the academic literature.

McMaster students taking the thesis option will spend the remainder of the summer and, if necessary, the fall term (in special cases extending into the following winter term) completing their research and their theses, which may involve the collection and analysis of field data or developing major conceptual works based on the literature.

4.6 Graduate Course Listing

Courses available to Global Health students at McMaster are listed in Table 2. Course descriptions are included in Appendix 1.

Table 2. Courses Available To M.Sc. Global Health Students at McMaster³				
Course	Faculty	2009-10⁴	2010-11	2011-12
Required				
GH 701 ⁵ Global Health Foundations I	Baumann, Stuttaford	F 20 / 30	F 25 / 40	F 25 / 50
Global St.710 Globalization: An Introduction	Coleman	F 35	F 40	F 40
HRM 721 Fundamentals of Health Research & Evaluation Methods	Staff	F 60	F 65	F 65
BUS C721 Health Policy Analysis	Randall	F 25	F 30	F 30
GH 702 ⁵ Global Health Foundations II	Baumann, Stuttaford	W 20 / 30	W 25 / 40	W 25 / 50
GH 710 ⁵ Learning Symposium and Field Orientation	Staff	S 20 / 30	S 25 / 40	S 25 / 50
Global Health Management Field				
Bus C711 Health Economics & Evaluation	Longo	W 18	W 20	W 20
Bus C741 Health Care Marketing	Wakefield	W 18	W 20	W 20
Bus I731 International Business	Yoshikawa	W 23	W 25	W 25
Global Diseases Field				
Biology 6P03 ⁶ Medical Microbiology	Jayaratne	W 20	W 22	W 22
Med Sci 717 Vaccines & Vaccine Immunology	Wan, King, Bramson	W 8	W 8	W 8
Med Sci 7XX Infectious Diseases	Staff	W 18	W 20	W 20
Globalization & Development Field				
Global St. 705 Global Public Policy	Coleman	W 18	W 20	W 20
Global St. 706 Social Welfare & Social Work in the Context of Globalization & Restructuring	Zhou	W 18	W 20	W 20
Global St. 712 International Trade & Economic Development	Drache	W 13	W 14	W 14
Global St. 764 Global Power, Local Cultures: Comparative Colonialism in Africa	Ibhawoh	W 13	W 14	W 14
Global St. 777 Global Governance	Porter	W 13	W 14	W 14
Electives				
BUS C722 Management of Population Health	Longo	W 18	W 20	W 20
HRM 748 Population and Public Health	Raina	W 43	W 45	W 45
HRM 770 Mixed Methods Research Designs for Health Services & Policy Research	Jack	W 17	W 19	W 19
GH 709 Statistical Methods	Akhtar-Danesh	W 25	W 27	W 27

3 Thesis students take the required courses and (if at McMaster) one course chosen from their selected field of study. Course-project students take the required courses and (if at McMaster) three courses from their selected field of study (one of these three courses may be replaced by one of the elective courses). McMaster students at Maastricht in the Winter term will take the three required modules offered at Maastricht.

4 F (Fall), W (Winter), S (Spring); Expected course enrolment

5 Course offered jointly & simultaneously at McMaster and Maastricht. Class size is XX at McMaster / YY at Maastricht

6 6 Level Course (Both advanced undergraduate and graduate course)

5. Outcomes and Governance Structure

5.1 Projected Graduate Intake and Enrolment

If approved, our intention is to admit the first class of a combined total of 50 students in Fall 2009 and continue to increase student intake to a combined total of 75 students by Fall 2011 (See Table 3). Maastricht anticipates a higher intake than McMaster. However, if student demand materializes at a higher rate than projected, McMaster will consider raising its annual intake targets. Ongoing admission into the program will be on an annual basis, with a new student cohort starting every September. We anticipate that five (5) thesis students and twenty (20) course-project students will be admitted each year at McMaster when the program reaches steady state. Intake and enrolment figures are almost the same, since the program is completed by the course-project students at McMaster and by all the Maastricht students in 12 months, with only a small number of McMaster thesis students who may take up to 20 months to complete.

Table 3: Projected Intake for Master of Global Health Program

Year	Institution			Intake/Enrolment
	Mac(CDN)	Mac(Visa)	Maastricht	Total
2009-10	16	4	30	50
2010-11	20	5	40	65
2011-12	20	5	50	75
2012-13	20	5	50	75

5.2 Governance Structure

The governance structure for the program has been designed so that there is a sharing of responsibility between McMaster and Maastricht, through co-directors; one at each of the universities.

5.2.1 Program Co-Directors

Each University will appoint a Co-Director, who will be responsible for local management and coordination of the Global Health program with the stream field advisors, and for relations with the Co-Director at the other university in planning and carrying out the collaborative program. There will be regular consultation on such matters as program marketing, admissions, and scheduling of courses, seminars, and workshops. This position is a rotating three year appointment, decided jointly at McMaster between the Associate Vice President, Faculty of Health Sciences International Health, the Dean of the DeGroote School of Business, and the Dean of the Faculty of Social Sciences. It includes an annual stipend. The Co-Director at McMaster will ensure that the Global Health program's operations are consistent with the short term and long term objectives of McMaster University and the participating Faculties, and will report and consult regularly with the Associate Vice President Faculty of Health Sciences International Health, the Dean of the DeGroote School of Business, and the Dean of Social Sciences.

5.2.2 Advisory Committees

Each university will have an advisory committee composed of faculty members or external members with research, teaching, or field experience who can assist the Co-Director in making plans and

decisions that are consistent with the long term goals of the program. These advisors may also be involved in teaching and research in fields relevant to Global Health, and will advise the Co-Directors at their universities on stream and course content, instruction, and other academic matters. Current membership of the McMaster advisory committee includes:

Dr. Andrea Baumann - Chair (International Health), Dean Paul Bates (DeGroot School of Business), Dr. Will Coleman (Institute for Globalization and the Human Condition), Dr. Mark Loeb (Pathology and Molecular Medicine), Dr. Hertzell Gerstein (Population Health Research Institute), Dr. Del Harnish (Biology and Pathology).

5.2.3 Administration (McMaster)

The McMaster administrative home for the program will be in the Faculty of Health Sciences, supported by an administrative component of program income. Funding for teaching will flow to the faculties according to an agreed formula, and student support will flow from the Faculty of Graduate Studies directly (scholarships) to all students and indirectly (TAs) to thesis students. Program administration will include organizing and managing applications and admissions, maintaining student records, marketing the program, and related program matters.

5.2.4 Academic Committee (McMaster)

The Co-Director will chair an academic committee composed of representatives from Health Sciences, Business, and Social Sciences. The academic committee will be responsible, in conjunction with their Maastricht counterparts, for setting target enrolments, and will oversee curriculum, admissions, reviews of student progress, scheduling, and the appointment of student advisors. An ad hoc committee will be appointed, also with representatives from the three faculties (typically the field advisors), to review student admission applications to the program.

5.3 Careers

Increasing numbers of persons working in Global Health have post-basic training, occasionally leading to a degree, in law, economics, business, education, sociology, psychology, informatics, development studies, and medical anthropology. The Master's in Global Health falls into this category. Healthcare professionals with training in this discipline can make an especially valuable contribution.

Graduates with field experience in a developing country are normally given preference in hiring. For persons working in short term assignments or primarily as clinicians, a Global Health degree adds little. However, for extended assignments and for jobs concerned with population-based research, training, and for jobs involving program development, implementation and evaluation, a Global Health degree can be valuable. The field of concentration will have some bearing on employability but not as much as the possession of a Global Health degree. This degree gives evidence of basic training in the core disciplines similar to most schools of public health: biostatistics, program planning, management, and leadership, especially if these augment one or more of the important programmatic content areas such as maternal and child health, health education, and environmental health.

APPENDIX 1. McMASTER COURSE DESCRIPTIONS

Required Term 1

GH 701 Global Health Foundations I (Joint) / Andrea Baumann (McMaster), Maria Stuttaford (Maastricht)

This joint course addresses cross-sectional and interrelated features of the health problems, issues, and concerns in the circumstances or experiences of nations that transcend national boundaries, and that are best addressed by cooperative actions and solutions. The critical relationships among health, healthcare, education, economic development, and business management will be explored in detail. Ethical issues in global health are also addressed. Discussion and interaction among the participants is strongly encouraged. The course will also include several seminars from recognized researchers in global health, and from field workers familiar with the aspects of what graduates from this program are likely to encounter in their careers, accompanied by significant interaction and discussion.

Global St. 710 - Globalization: An Introduction / Will Coleman

An introduction to major theories and debates in the field of globalization studies.

HRM 721 Fundamentals of Health Research and Evaluation Methods / Staff

The major components of research activities are covered, including concepts of health, formulation of research questions, literature reviews, study designs, selection of study populations, choice of measuring instruments, and study interpretation issues such as determination of causality and the effectiveness of clinical and community interventions.

BUS C721 - Health Policy Analysis / Glen Randall

This course will examine the field of health policy analysis with particular emphasis on clinical, administrative and government policy. After establishing a framework by which to analyze policy – which will include consideration of stakeholders, pressure groups, values, institutions, and the media – various tools will be studied as means of formulating and evaluating policy. Techniques from business, political science, economics, sociology, epidemiology, and history will be used. Specific policy topics will be presented as illustrations of this management art.

Required Term 2

GH 702 Global Health Foundations II (Joint) / Andrea Baumann (McMaster), Maria Stuttaford (Maastricht)

Program and project management skills are essential to every graduate from this program. This course introduces global health program and project management, and demonstrates their application using real cases from each of the three Global Health program fields. Interaction among, and contributions from students are strongly encouraged. The course will also include regular weekly seminars, presented by students and their supervisors or advisors, resulting from their studies of global health issues, and accompanied by significant interaction and discussion with other students, instructors, and supervisors.

Required Spring Term

GH 710 - Learning Symposium and Field Orientation / Staff

The aim of the learning symposium is to provide students with the opportunity to exchange knowledge, as equal partners, at a location that will provide a learning environment for all participating. Under the guidance of staff from both universities, students from Maastricht and McMaster Universities will come together to exchange and unify perspectives on global health issues. Learning will be enhanced through special lectures by experts in the field, field visits, small group discussions, and the presentations of conclusions from project work undertaken during the Foundations modules. During this period, students will also present their research proposals, in order to receive feedback from peers.

McMaster Courses Term 2 by Field⁷

Global Health Management

BUS C711 - Health Economics and Evaluation / Chris Longo

This course will examine the application of economic principles to policy-relevant questions in the area of health and healthcare. Topics will include applied health economics, economic correlates to health, demand and supply of healthcare and insurance, healthcare system financing, alternative payment schemes, economic regulation of the pharmaceutical industry, cost-effectiveness and cost-benefit analyses, QALY's, and means by which to improve value-for-money in the health sector.

BUS C741 – Health Care Marketing / Patricia Wakefield

This course provides an in-depth understanding of the key concepts of marketing and their application to the rapidly changing public and private health care environment. Students build practical skills: in analyzing marketing problems in for-profit and not-for profit health care organizations in Canadian, U.S. and other international settings; and, in developing programs and strategies applying marketing tools and principles (such as pricing, promotion, products/services, consumer behavior, branding, segmentation, social marketing and health promotion). Students also increase their appreciation of the role of data collection, analysis, interpretation, and management in health care marketing decisions. The course consists of case discussion, lectures, guest speakers, readings (cases, articles, textbook), and practical field experience whereby student teams undertake marketing consulting projects in local health care organizations.

BUS I731 - International Business / Toru Yoshikawa

This course examines the environmental analysis of international business and surveys a number of managerial issues related to international operations. Macro strategic decision making and alliance formation are studied as are functional decision making in the areas of finance, accounting, marketing, human resources, sourcing, and production. The course acquaints students with available databases and their use, and requires a research project to be undertaken.

⁷ Thesis students choosing a particular field must select one of the courses listed for that field. Course-project students must select two courses from their chosen field and one course from the list of electives.

Global Diseases

Biology 6P03 - Medical Microbiology / Padman Jayaratne

Microbial infectious diseases of humans: ecology, evolution, epidemiology, immunity, pathogenesis and the treatments of these diseases.

Medical Sciences 717 - Vaccines and Vaccine Immunology / Yonghong Wan, Zhou Xing, Jonathan Bramson

Vaccines and vaccine immunology have become an important sub discipline of modern biomedical practice and research. It becomes increasingly important to both prevention and treatment of infectious diseases, cancer, autoimmune diseases and allergic diseases. This course is designed to provide graduate students with the basic concepts of current human vaccination programs, methods used to developing various forms of new vaccines, and vaccine immunology.

Medical Sciences 7XX – Infectious Diseases / Mark Loeb

This course will provide an overview of disease patterns in new and emerging infectious diseases. The content includes an examination of recent therapies and interventions used in the developing world to combat the spread as well as possible eradication of targeted diseases. It will cover important topics such as anti-microbial resistance, strategies for treatment and control, as well as field interventions.

Globalization and Development

Global St. 705 - Global Public Policy / Will Coleman

An examination of policy-making at global institutions and the relationships with other scales of policy formation.

Global St. 706 – Social Welfare & Social Work in the Context of Globalization & Restructuring / Rachel Zhou

This course focuses on the dynamics and consequences of the restructuring of social programs in Canada. Attention will be given to policy trends toward privatization and market models of service delivery, to changes in the practices of social welfare institutions and to changes in the meaning of citizenship and political participation.

Global St. 712 - International Trade and Economic Development / Daniel Drache

This course studies the economic impacts of world trade on developing countries.

Global St. 764 – Global Power, Local Cultures: Comparative Colonialism in Africa / B. Ibhawoh

A comparative study of the processes by which imperial global power and local responses shaped the political, economic and cultural history of Africa in the late 19th and 20th centuries.

Global St. 777 – Global Governance / R. O'Brien, T. Porter

This course examines the institutions and processes of global governance. It considers different theoretical approaches to understanding rule creation and maintenance on a global scale. Approaches and issues that will be examined include: neoliberal and neorealist regime theory; critical theory approaches; international law, the role of corporations and private authority and the activity of global civil society.

Electives

BUS C722 – Management of Population Health / Chris Longo

The Management of Population Health takes a meta-approach to health issues focusing on strategies to improve health and well-being while controlling costs. Several frameworks will be critiqued and concepts studied will include, but will not be limited to, the correlates of the health of different populations, the stages of the life cycle, the burden of illness for society, contagions and public health, the congruence between evidence and policy, prevention, community action, and the development of students' critical appraisal skills.

GH 709 - Statistical Methods / N. Akhtar-Danesh

This course focuses on the main statistical issues that might be useful in nursing research. Some specific topics of the course are descriptive statistics, probability distributions (binomial, Poisson, normal), comparison between two mean values, one-way and two-way Analysis of variance (ANOVA) and post-hoc tests, correlation and simple linear regression analysis of the frequency tables, and some non-parametric tests.

HRM 748 - Population and Public Health / Parminder Raina

This course provides an overview of core concepts and methods in population and public health. We will discuss the concept of population health and explore the methods used to define, measure, and investigate health outcome and health determinants at a population level. The applications of this approach to public health will be discussed.

HRM 770 - Mixed Methods Research Designs for Health Services and Policy Research / Susan Jack, Staff

This course introduces students to the major concepts and issues involved in mixed methods approaches to tackle important questions in the field of health services and policy. LearnLink is used as the mode of instruction. A framework for thinking about mixed methods will be developed that provides guidance to decision-making about when and how to use mixed methods and models to study health services and policy problems. The course will provide students with knowledge of the current controversies and major challenges in the use of mixed methods and models of research. Students are expected to design a mixed method study as part of the course and critically evaluate the design options chosen by a classmate.

Appendix 2. Maastricht Term 2 Modules

“Implementing Innovations on a Global Scale”

Module 1: Globalization and Transferability: Building Networks in Genomics and Biotechnology (5wks)

Coordination: Rein Vos (FHML; HES), Angela Brand (FHML; INTHEALTH), Guillaume van Eys (FHML; MG)

In the last decade new technologies such as genomics and biotechnology have had a world-wide impact. New hopes are ventured and many stakeholders make claims about the promises and expectations which these new technologies may have with respect to major health problems in a globalised world. Genomics and biotechnology illustrate the way new ‘large-scale’ science develops by creating networks of different stakeholders connecting parties across the globe. Conversely, these networks have major impacts on citizenship and daily life and health of people throughout the world. Science co-evolves with the development of new legal, moral and regulatory regimes. Therefore, the ‘conventional’ view: first science, then technology and subsequently implementation in society has to be discarded. Scientific and technological developments evolve together with social, legal, ethical and cultural developments. An example here may be the development of corn genetically modified to produce better crops, among others through resistance against parasites occurring in specific global regions. Although crops improved, genetically modified products met resistance from worried citizens in industrialized societies. As a consequence, product information must now specify whether the item contains genetically modified components; which may in turn reduce its marketing opportunities. Thus, technologies are affecting the continuum of health, nutrition, food security and sources of income, such as the availability of medication or seeds to grow crops. But these technologies also influence the way communities respond to health and development interventions and the way public trust and accountability is shaped.

Drawing from the biosciences as well as from the social sciences and building on the modules (Maastricht University) and courses (McMaster) of the Fall term, this module critically reflects on promises and challenges of recent developments in (public health) genomics and bio-engineering in relation to global health. After having been introduced to the major health issues and practices related to public health genomics and biotechnology, students will be challenged to explore the development of scientific and technological networks, taking public health genomics and biotechnology – both the ‘green’ and the ‘red’ biotechnology – as paradigmatic cases. Thus, students will be prepared for a role as leader, policy-maker or manager, able to address the challenges involved in the implementation/translation of innovative technologies in a changing global reality.

Module 2: Medical Mobility: Outsourcing, Telemedicine, Medical Tourism and “Brain Drain” (5 wks)

Coordination: D. Townend (FHML; HES); A. Verbon, (FHML; MMB)

In the last decade the global transfer (real as well as virtual) of patients, professionals, knowledge, data, practice, technology, skills and capital has markedly increased. This occurs through different mechanisms. Through *medical outsourcing* a health care provider engages individuals or institutions outside their own organisation to provide medical services; *telemedicine* enables the electronic delivery of these services, either clinical (such as specialists consultations) or diagnostics (e.g. using

Indian radiologists to read radiographs during European or North American “out of office” hours); through *medical tourism* individuals obtain health care in another country (e.g. Indian hospitals offer high quality but cheaper heart surgery for foreign patients than ‘at home’). These may or may not be positive developments in health care delivery. However, a ‘brain drain’ is also seen in developing countries where highly skilled medical personnel emigrate to developed countries. This results in a situation where on one hand the receiving health care system becomes increasingly dependent on “foreign” staff and on the other, the country from which staff move lack sufficient medical staff. This globalization of the health care system raises concerns about medical, regulatory, legal, financial and policy issues.

This module will explore these processes and reflect on the possibilities and challenges they present for Global Health Governance and collaboration.

Module 3: Health In Times Of Crisis (5 wks)

Coordination: Jessica Mesman (FaSoS; S&T), Rachna Zeiss (ICIS)

Today’s societies can be considered as tightly knit systems in which science and technologies are pervasive. All kind of technologies support and strengthen the structures of our societal domains. However, the technological character of today’s societies makes these structures vulnerable at the same time. Such vulnerability thus is an inherent characteristic of today’s societies. Sometimes this quality turns into a problem or even a disaster. Risks to health, safety, freedom of choice, privacy and our environment are abounding in the world. During the last decades we have witnessed several high-tech related disasters. The Chernobyl nuclear accident, the Bhopal chemical disaster in India, and the Exxon Valdez oil spill — they all remind us that large-scale systems are vulnerable to human errors and technical malfunctions with far-reaching consequences for the health of men and its environment. Besides technological disasters, also natural disasters and warfare have a huge impact on health situation of individuals or populations. Besides these explicit forms of crisis, this course also discusses so-called ‘hidden’ forms of crisis: these are unintended, and at first sight not clearly related, consequences of technological interventions on health and health care. However, the impact of war and natural and industrial disasters on health often exceeds the boundaries of isolated countries. Therefore, this course will study the vulnerability of health in modern societies as a vulnerability of global technological culture.

With its focus on health issues that occur in times of crisis, the course critically reflects on current strategies/policies to prevent and to respond to these crises. In addition, it discusses the possibilities and impossibilities of alternative approaches to crisis/disaster management. The argument this course aims to make contrasts with commonly accepted health-risk management theories and practices that argue that it is important to define clear rules and protocols and make sure they are followed in order to make a society/ community as safe and healthy as possible. This ‘standard’ approach will be questioned in this course. Alternative ways of conceptualizing health, disease and governing health crisis will be discussed. Therefore, an inter-disciplinary study of the vulnerability and resilience of health care systems is required.

This course will be structured in three parts: first, the problem of vulnerability of health in a global world will be framed by reviewing a broad range of empirical domains. Students will reflect on both short term (e.g. diarrhoea and cholera) and long-term effects (e.g. cancer, trauma and amputations). Second, various theoretical approaches to study this specific vulnerability in times of crisis are explored; and third, these new conceptualizations are translated for and applied to issues of politics and governance.

**Proposal to develop a Health Management Degree:
A Partnership between the School of Rehabilitation Science
and DeGroot School of Business**

October 15, 2008

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EXECUTIVE SUMMARY

Both the DeGroot School of Business and the School of Rehabilitation Science have been investigating the development of educational approaches to provide health management learning for a range of health professionals. Rather than develop separate approaches, the two Schools have come together to propose a new program in Health Management that will be similar in structure to the already successful course-based, online Master of Science program currently run out of the School of Rehabilitation Science. We are excited about the potential of this partnership to foster increased collaborations across faculties and to meet the educational needs of today's health professionals.

There is considerable need for a degree at the master's level for regulated health professionals who wish to gain a broader understanding of the Canadian health care policy development and service delivery environment as well as core management knowledge and skills. This proposed program would initially target health professionals who are currently working and do not wish to undertake full-time studies. Data from Health Canada and the Canadian Institute of Health Information reveals that there are between 600,000 and 800,000 health professionals (depending on how they are defined) practising in Canada.

In order to meet the graduate education demands of this group of health professionals, we propose the creation of a new program that would harness the health care expertise that exists across McMaster University. The new program largely builds on and uses courses currently run in either the online program or the MBA program. It would be offered through a partnership between the DeGroot School of Business and the School of Rehabilitation Science and would provide students with access to courses from professional and disciplinary specific departments and programs across campus.

The proposed MSc (Health Management) degree is intended to provide regulated health professionals with a combination of core management skills (accounting, finance, marketing, human resource management etc.) and a broad understanding of the Canadian health care policy development and service delivery environments (health system design, health policy analysis, and evidence based decision-making). Students will gain the knowledge, skills and abilities necessary to excel as a middle or senior manager within both the public and private spheres of Canada's health care sector. The program will be of particular interest to regulated health professionals wishing to gain the skills and credential that will facilitate their advancement within the non-profit health care system (hospitals, long-term care facilities, etc.) or for those health professionals who are currently working, or plan to work, in the for-profit health care system either in private practice or as part of a larger corporate entity.

The degree MSc. Health Management would consist of 8 half credits (5 core courses, 1 elective, and a 2 credit scholarly paper). The proposed courses are as follows:

1. **Health Systems and Policy (modified from current course Business C721)** (Canadian health care system; comparative health systems; health policy analysis; evidence-based decision-making; basics of population health etc.)
2. **Evaluating Sources of Evidence for Management and Evaluation** (research methods; critical evaluation of research; measurement and evaluation etc.)

3. **Health Management Foundations I** (human resources management; legal issues; contract negotiations; marketing; organizational behaviour etc.)
4. **Health Management Foundations II** (basics of finance; accounting; budgeting; forecasting; etc.)
5. **Elective** (a graduate level course may be taken from health profession masters programs or from the MBA curriculum)
6. **Scholarly Paper** (2 credits) (requires students to design the project; collect (in some circumstances), manage and analyze data; and prepare a detailed report)
7. **Leadership in Health Organizations** (Capstone course - leadership; ethics; communications; strategy; risk management, etc.)

The proposed degree will be an equal partnership between the schools in all respects. Each course will be planned by faculty from both schools. Courses with significant inter-disciplinary content between the two departments will be co-coordinated.

Funding for this initiative will come from the MTCU (Ministry of Training, Colleges and Universities) grant funds and tuition funds provided to the university through graduate expansion. A half time program coordinator and half time program assistant will be required, in addition to course coordinators and course facilitators. Positions will be funded from course income and the additional BIU (Basic Income Units) funding.

No graduate scholarships will need to be funded from this initiative as the program will initially be offered on a part-time basis only. Given the online learning format, students are on campus only for two short residency periods and will only use campus services such as registration and online library access. Since the initiative is revenue-generating and delivered primarily in an online format, we propose a relatively large proportion of income be retained by the schools. In Year 1, 100% of the income flows to the initiative to assist with development costs. In Year 2, 90% would flow, and in subsequent years, 80% of the revenue would flow to the initiative. Enrolment is estimated at 15 students in year 1, 30 in year 2, and 45 in year three.

The proposed partnership between the DeGroote School of Business and the School of Rehabilitation Science is an ideal partnership. The School of Rehabilitation Science already has a similar Master of Science degree (without the management components) in place and has developed critical experience with the delivery of online courses. Additionally, Health Sciences at McMaster has a positive reputation among health care professionals across Canada. The DeGroote School of Business already offers several courses dealing with key health services management topics and has built a solid reputation for delivering quality management education through its MBA program and Health Services Management specialization of the MBA program. This project would demonstrate a real cross-campus partnership in support of the McMaster University Collaborations for Health initiative.

BACKGROUND

As McMaster University considers mechanisms to foster collaboration among the various faculties, one promising area is a partnership between the DeGroot School of Business and the Faculty of Health Sciences. While McMaster University already has a wide range of graduate education programs available to students interested in health care, these programs have been largely discipline specific and have not permitted students to fully benefit from the vast range of health care expertise that exists throughout the various faculties at McMaster University. One recent notable exception has been the creation of a new multidisciplinary PhD in Health Policy.

Our preliminary investigations into potential partnerships and untapped markets suggest that there is a substantial number of health professionals who would like to both pursue graduate education and acquire management skills but do not want to focus too narrowly on either advanced education within their health profession area or in business administration. Rather, these individuals appear to want to follow a more flexible road that can be adapted to their changing career needs and goals. For example, McMaster's DeGroot School of Business offers a Health Services Management stream as part of the MBA program, however, this option attracts a relatively small proportion of health professionals. In fact, the majority of students in this stream each year are non-health professionals, often business students who want some academic exposure to health services. This raises the question: why don't more health professionals apply to our MBA program?

Clearly this lack of health professional enrolment in the MBA program is not related to a lack of need for, or interest in, gaining a wide range of management skills. Based on our preliminary investigations, the following appear to be the major issues of concern which deter working health professionals from applying to the MBA program:

- Reluctance to take the GMAT test.
 - Financial cost.
 - Time needed for test preparation.
 - Inconvenient to write the test.
- Inconvenience of program/course offerings for part-time students.
 - Travel distance to McMaster (lack of satellite locations).
 - Lack of distance/online education options.
 - Limited evening/weekend/summer course offerings.
- Concern about the length and content of the program.
 - For part time students, it takes an average of 7 years to complete McMaster's MBA if a student takes one course every term (including over the summer). This is much longer than graduate degrees for some discipline/profession specific programs which can require as few as 6 or 7 half courses and some of which can be completed on a part-time basis in as little as 20 months.

- Typically, no advanced standing is granted for health professionals who may already have significant education and professional experience.
- Most health professionals interested in an advanced degree want additional knowledge, skills and abilities but do not require or desire the depth associated with a full MBA program.

Addressing these concerns may lead to a significant opportunity for McMaster University. With a potential market approaching three-quarters of a million health professionals across Canada, the university that meets the needs of this population can expect substantial rewards to accrue in terms of both its reputation and financial situation. While specialized MBAs, joint degrees, diplomas, and executive education may suit the needs of some professionals, they simply do not address the needs of most health professionals, a largely ignored mass market.

Both the DeGroot School of Business and the School of Rehabilitation Science have been investigating the development of educational approaches to provide health management learning for a range of health professionals. Rather than develop separate approaches, the two Schools have come together to propose a new program in Health Management that will be structured similarly to the already successful, online Masters program currently run out of the School of Rehabilitation Science. We are excited about the potential of this partnership to foster increased collaborations across faculties and to meet the educational needs of today's health professionals.

The Need: Why do Health Professionals Want Graduate Education in Management?

- To satisfy general interest and meet their professional development needs.
- To obtain a graduate credential to facilitate promotion within the workplace. This has been especially pronounced in the hospital sector where the typical requirement for any management position now includes a graduate degree in a related discipline.
- To obtain specific management skills. This is of particular interest to health professionals who work in private practice but did not obtain these skills during their profession-specific education.

What Health Professionals Want in Graduate Education?

- A graduate degree rather than a diploma or executive education.
 - Since a large proportion of health professionals would be pursuing management education first and foremost as a means of gaining a graduate credential (Masters Degree) approaches which focus primarily on providing knowledge/skills and a diploma or certificate of completion would severely limit the potential market.
 - The cost of executive education is prohibitive for majority of allied health professionals
- A flexible education format that would not interfere with their full-time employment.
 - We therefore propose a part-time only format (at least initially).

- The format would be a hybrid model, including a combination of distance (online) and on-site learning. A benefit of this approach is that students would meet their fellow students initially to build some relationships. In addition, the demand on the University's physical resources could be minimized as some courses would be offered online or in low demand periods (such as August).

Potential Target Market:

This proposed program would at the outset target health professionals who are currently working and do not wish to undertake full-time studies. Data from Health Canada and the Canadian Institute of Health Information reveals that there are between 600,000 and 800,000 health professionals (depending on how they are defined) practising in Canada. A small proportion of these individuals have graduate degrees. While some of the health profession programs are currently offered at the graduate level (e.g. occupational therapy and physiotherapy) they generally provide little in the way of specific management education. In addition, the primarily online model of this program would facilitate international access to the program.

Table 1: Major Allied Health Professions by Province

Profession	BC	AB	SK	MN	ON	QU	NB	NS	PE	NF	T	TOTAL
					HC/04							
Nurses (RN) 2006 (CIHI)	29557	27308	8631	11268	102461	66148	7998	9098	1444	5559	1373	270,845
OT (CIHI, 2007)	1434	1242	217	456	4002	3288	245	309	33	129	23	11,378
Pharmacists					9000							~ 20,000
Physiotherapist					5800							~ 15,000
Social Workers					9400							~ 25,000
TOTAL												~340,000

There are currently 28 regulated health professions in Ontario. The initial target market is aimed at allied health professionals with four-year undergraduate degrees. However, individuals with health professional degrees of less than four-years who have additional education, such as practical nurses, and individuals with health professional degrees at the master's level, such as speech language pathologists, would also be eligible. In addition, this degree would be of interest to several newly regulated health professions including kinesiology.

PROPOSAL

In order to meet the graduate education demands of this group of health professionals, we propose the creation of a new program that would harness the health care expertise that exists across McMaster University. The new program builds on and uses courses currently run in either the online program or the MBA program. The new program would be offered through a partnership between the DeGroot School of Business and the School of Rehabilitation Science and would provide students with access to graduate level courses from professional and disciplinary specific departments and programs across campus.

The proposed MSc (Health Management) is intended to provide regulated health professionals with a combination of core management skills (accounting, finance, marketing, human resource management etc.) and a broad understanding of the Canadian health care policy development and service delivery environments (health system design, health policy analysis, and evidence based decision-making). Students will gain the knowledge, skills and abilities necessary to excel as a middle or senior manager within both the public and private spheres of Canada's health care sector. The program will be of particular interest to regulated health professionals wishing to gain the skills and credential that will facilitate their advancement within the non-profit health care system (hospitals, long-term care facilities, etc.) or for those health professionals who are currently working, or plan to work, in the for-profit health care system either in private practice or as part of a larger corporate entity.

Some of the distinctive aspects of the design are as follows:

- offered in partnership between the Schools of Business and Rehabilitation Sciences (with access to courses in other departments/programs);
- targeted to regulated health professionals;
- offered on a part-time basis only (at least initially);
- students would move through the program as a cohort;
- offered through a combination of on-site and online delivery; students who are not local may complete the program with as little as two short residency periods (of 3 days each) while local students may wish to attend one or more traditional on-site courses; and
- completion within as little as 20 months.

Admission requirements would include:

- Regulated health professional (evidence of registration in the applicant's professional affiliation in his/her own province/country)
- Graduation with a minimum of a B+ average from a 4-year health professional program
- Two clinical or work place related references.
- Written application outlining career plans, research interests and suitability for the MSc Health Management Program
- Identification of a faculty member who agrees to supervise the student's scholarly paper.

- For foreign applicants whose native language is not English, evidence of proficiency in the use of the English language. The most common evidence is a score of at least 580 (paper test) or 237 (computer test) on the Test of English as a Foreign Language (TOEFL).

The program (Health Management) would consist of 8 half credits (5 core courses, 1 elective, and a 2 credit scholarly paper). The proposed courses are as follows (see appendix 1 for graphic description of the program and appendix 2 for a more detailed description of the content of each course):

1. **Health Systems and Policy (modified from current course Business C721)** (Canadian health care system; comparative health systems; health policy analysis; evidence-based decision-making; basics of population health etc.)
2. **Evaluating Sources of Evidence for Management and Evaluation (Current course-based, online course Rehabilitation Science 705, with added health management problems and examples)** (research methods; critical evaluation of research; measurement and evaluation; etc.)
3. **Health Management Foundations I** (human resources management; legal issues; contract negotiations; marketing; organizational behaviour; etc.)
4. **Health Management Foundations II** (basics of finance; accounting; budgeting; forecasting; etc.)
5. **Elective** (course may be taken from health profession masters programs or from the MBA curriculum)
6. **Scholarly Paper** (2 credits) (Current course-based, online course 730) (requires students to design the project; collect (in some circumstances), manage and analyze data; and prepare a detailed report)
7. **Leadership in Health Organizations (modified from current online course Rehabilitation Science 770)** (leadership; ethics; communications; strategy; risk management, etc.)

BENEFITS OF BUSINESS/REHABILITATION SCIENCES PARTNERSHIP

The proposed partnership between the DeGroot School of Business and the School of Rehabilitation Science is ideal as the model has several important benefits.

- The DeGroot School of Business already offers several courses dealing with key health services management topics.
- The DeGroot School of Business has built a solid reputation for delivering quality management education through its Health Services Management program.
- The School of Rehabilitation Science already has a similar (without the management components) Master of Science degree in place (established in 2004, in partnership with UBC, with approximately 100 students from diverse health profession backgrounds, including some international students). Their current program accepts admissions in September and January and is completed online. Structuring a new “health management” program after the Rehabilitation Science program may allow us to start by September, 2009.
- The School of Rehabilitation Science has successful experience with online courses and already has three of the potential courses in place for their current online MSc. degree.
- The School of Rehabilitation Science would be able to provide access to a list of existing Masters level courses as possible electives and would make faculty available as supervisors or co-supervisors for the major student report/paper).
- The School of Rehabilitation Science already has an administrative structure in place for its online degree (one-half person time).
- Health Sciences at McMaster has a positive reputation among health care professionals across Canada.
- This project would demonstrate a real cross-campus partnership in support of the McMaster University Collaborations for Health initiative.

RESOURCES REQUIRED

Funding for this program will come from the grant and tuition funds provided to the university through graduate expansion. A projected budget is attached to the proposal. A half time program coordinator and half time program assistant will initially be required, and will be funded from course income and the additional BIU funding. No graduate scholarships will need to be funded from this program as the program will initially be offered on a part-time basis only. Given the online learning format, students are on campus only for two short residency periods and will only use campus services such as registration and online library access. Since the program is revenue-generating and delivered primarily in an online format, we are proposing that in Year 1, 100% of the income flow to the program to assist with development costs. In Year 2, 90% would flow to the program and subsequently, 80% of the revenue would flow to the program.

One of the chief benefits of this educational model is the limited resources required as compared to traditional programs.

Physical space:

- Some limited on-site course time would be during non-peak times (e.g. first course in August for 3 days on-site).
- Most of the course work would be online.
- Electives may be chosen from online or existing on-site courses, therefore maximizing current class room utilization.
- Administrative space is already in use for Rehabilitation Science's online degree program (no additional space would be required unless the program grew very large).

Faculty and Staff:

- A half-time faculty program coordinator would be required
- One half of an administrative staff position would be required; this position would become full-time once enrolment increased to 45 students per year.
- Minimal cost associated with having faculty members supervise major report/paper.
- Three courses are already available and need minimal modifications to add health management problems to them. Only three courses would have to be developed. There are full or part-time faculty with both Schools who have the expertise to deliver these courses.
- Since students move through the program in a cohort, only one course is offered each term which makes mounting and monitoring the program fairly straight forward.
- Overview of Core Faculty is provided in Appendix 4.

Marketing:

- Since regulated health professionals are all required to become members of a regulatory body it is possible to have direct contact with everyone in our target population. In fact, most provinces require that at least the work addresses of regulated health professionals be made publicly available. For most regulatory bodies, mailing lists may be purchased or direct email may be conducted through the regulatory body.
- Since many health employers are requiring that their managers have or are working towards a Masters degree, the major health employers may also represent an important target for marketing the program.

SUMMARY

The proposed partnership between the DeGroote School of Business and the School of Rehabilitation Science is an ideal partnership. The School of Rehabilitation Science already has a similar Master of Science degree (without the management components) in place and has developed critical experience with the delivery of online courses. Additionally, Health Sciences at McMaster has a positive reputation among health care professionals across Canada. The DeGroote School of Business already offers several courses dealing with key health services management topics and has built a solid reputation for delivering quality management education through its MBA program and Health Services Management specialization of the MBA program. This project would demonstrate a real cross-campus partnership in support of the McMaster University Collaborations for Health initiative.

APPENDIX 1: MSc (HEALTH MANAGEMENT) PROGRAM

Proposed Course Schedule for MSc (Health Management)
 (consists of 5 core courses, 1 elective and a 2 credit scholarly paper)

Term 1	Health Systems and Policy (Canadian health care system; comparative health systems; health policy analysis; etc.)	
Term 2	Evaluating Sources of Evidence for Management and Evaluation (research methods; critical evaluation of research; measurement; etc.)	
Term 3	Health Management Foundations I (human resources management; legal issues; contract negotiations; marketing; organizational behaviour; etc.)	
Term 4	Health Management Foundations II (basics of finance; accounting; budgeting; Forecasting; etc.)	<p>Scholarly Paper</p> <ul style="list-style-type: none"> • detailed proposal requires approval by end of fourth term • final project to be submitted by end of eighth term
Term 5	Elective (course may be taken from health profession master's programs such as nursing or social work or may be taken from the MBA)	
Term 6	Leadership in Health Organizations (leadership; ethics; communications; strategy; risk management; etc.)	
Term 7		
Term 8		

APPENDIX 2: COURSE DESCRIPTIONS

1. Health Systems and Policy

Description:

This course is the introductory course for the MSc (Health Management) program. It will provide students with an understanding how the Canadian health care system is organized as well as how services are financed and delivered. This will be done through an assessment of the *Canada Health Act* and various pieces of related provincial health care legislation. Discussions will include an exploration of the for-profit and not-for-profit mix of services within Canada. In addition, students will be exposed to the principles of evidence-based decision-making and various health policy analysis tools. Current issues and trends in health policy (both within Canada and internationally) will serve as cases to which students apply those tools.

Objectives:

Upon completion of this course students will be able to:

- describe how health care is organized, funded and delivered within Canada;
- demonstrate an understanding of current issues and trends in health policy; and
- describe and apply health policy analysis tools in examining complex health policy issues.

Delivery Methods:

This course will be offered through a combination of online and on-site delivery. Topics will initially be explored online through a review of documents, discussions, and course assignments. Students will then be required to meet on-site for an intensive 3-day (Thursday noon to Saturday noon to minimize time away from work/home) period (the last week of August) of presentations and discussions. This is the first of two on-site residency requirements for the program. Students will be responsible of all costs associated with travel and/or accommodation to attend each of the two on-site residency periods.

2. Evaluating Sources of Evidence for Management and Evaluation

Description:

This course will equip students with an understanding of evaluating sources of evidence to support decision making within a clinical environment. Students will be exposed to a range of methodological issues, their impact upon research and how information is to be interpreted.

Objectives:

Upon completion of this course students will be able to:

- understand qualitative and quantitative research methodologies;
- critically read and evaluate evidence to make practice decisions that lead to best client outcomes

Delivery Methods:

This course is delivered in an online only format. Topics are explored through a review of documents, course assignments, case studies and online discussions.

3. Health Management Foundations I

Description:

This course will provide students with exposure to the management principles and practices involved in the delivery of health care products and services in for profit and not for profit environments. The impact of cultural and ethical issues will be considered on workplace structure and the selection and development of marketing and communication strategies. Course content includes:

- human resources;
- legal issues;
- negotiations;
- organizational behaviour; and
- marketing principles and theories and their application in health care management.

Objectives:

Upon completion of this course students will be able to:

- demonstrate how managers can create healthy workplaces;
- understand different approaches to the evaluation of employee performance;
- understand the role and impact of collective agreements on the workplace;
- understand the key concepts of strategic marketing and how to apply them in the health care sector (both for profit and not-for profit)
- have working knowledge of the elements of the marketing mix and how to apply them to health care marketing situations
- be aware of the interrelationship between marketing and other functional areas within healthcare organizations (e.g., operations, human resources, information systems and finance).

Delivery Methods:

This course is delivered in an online only format. Topics are explored through a review of documents, course assignments, cases and online discussions.

4. Health Management Foundations II

Description:

This objective of this course is to introduce students to the fundamental concepts and practical issues related to accounting and finance and their uses in planning, decision making and control in health care management. Course content includes:

- basics of managerial finance;
- basics of managerial accounting;
- budgeting; and
- forecasting.

Objectives:

Upon completion of this course students will be able to:

- understand the concepts of risk and required return;
- analyze the set of investment opportunities, identifying those that will create shareholder value
- define the different types of costs including direct costs, indirect costs, variable costs, fixed costs, product costs, and period costs;

- determine the full cost/direct costs of a given object such as a product, a service, and a department;
- conduct detailed variance analysis in evaluating the performance of a business unit in an organization; use relevant cost information in making product/service decisions including pricing, outsourcing, operations planning, and capital investments

Delivery Methods:

This course is delivered in an online only format but may have an on-site period. Topics are explored through a review of documents, course assignments, and online discussions.

5. Elective

Description:

The elective course is selected from among a wide range of graduate level business and health profession specific offerings.

Objectives:

This course permits students to explore in greater depth either an area of business interest or a health profession specific topic to assist in meeting their personal learning objectives. Students may take either an online or onsite course.

Delivery Methods:

The delivery method is dependent upon the course selected. For students who wish to complete the bulk of the course requirements from a distance, there are several online course options available.

6. Scholarly Paper (2 credits)

This full course is designed as an opportunity for graduate course-based MSc students to demonstrate, in writing, their ability to integrate ideas that reflect current knowledge in areas of health management, education, research, and/or policy. The scholarly paper is to demonstrate integrative thinking at a general and abstract level. A student will identify a topic, and in consultation with a faculty member with expertise in the area develop a proposal that is individualized to the student's area of interest. The student will then develop the paper under the guidance of a faculty member. The paper must be 15 to 20 pages, excluding references and appendices. The paper does not require the collection or analysis of primary data or the conduct of research with subjects (although this may be an option in some instances). It is a scholarly essay, not a thesis.

Objectives:

Upon completion of this course students will be able to:

- demonstrate their ability to write a coherent research proposal;
- collect both qualitative and quantitative data;
- analyze data using a combination of statistical and policy analytical techniques; and
- prepare a comprehensive report (of a publishable quality).

Delivery Methods:

This course will take place over a twelve-month period as students simultaneously undertake other course work (only one additional course at a time). All aspects of the course may be completed online. Depending on the specific project topic, some students may need to conduct fieldwork to collect necessary data.

7. Leadership in Health Organizations***Description:***

This course explores principles, practices, trends and issues of leadership in health care settings. Current theories of leadership with attention to styles, practices, tasks and models will be covered. Participants will be encouraged to reflect on and analyze their own leadership experiences in light of theories studied. Through the interplay of theory and practical application, participants will gain a deeper appreciation for the requirements, responsibilities, and consequences of effective leadership. The course encourages professional and personal development through action learning that is relevant and transferable to organizations.

Objectives:

Upon completion of this course students will have:

- better understanding of effective leadership styles and practices
- perform analysis on personal leadership
- apply knowledge into workplace

Delivery Methods:

This course will be offered through a combination of online and on-site delivery. Topics will initially be explored online through a review of documents, discussions, and course assignments. Students will then be required to meet on-site for an intensive 3-day period of presentations and discussions. This is the final of two on-site residency requirements for the program. Students will be responsible of all costs associated with travel and/or accommodation to attend each of the two on-site residency periods.

APPENDIX 3: BUDGET

Production/Maintenance Costs	2009/2010		2010/2011		2011/2012		2012/2013		2013/2014		
	Base	#	\$\$	#	\$\$	#	\$\$	#	\$\$	#	\$\$
Course Designer - Adapt	2,000	2	4,000	4	8,000		0		0		0
Course Designer - New	8,000	3	24,000		0		0		0		0
Course Coordinators	7,000	4	28,000	7	49,000	7	49,000	7	49,000	7	49,000
Course Facilitators	5,000	0	0	6	30,000	10	50,000	10	50,000	10	50,000
Scholarly Paper Readers	1,000	0	0	10	10,000	35	35,000	45	45,000	45	45,000
Admin Support (.5 until yr 2; 27 % Ben, Base 40K, 6.6 % increase)	40,000	0.5	25,400	1	54,153	1	57,727	1	61,537	1	65,598
WebCT Support (.2 FTE, 27% Ben; 6.6 % Increase)	50,000	0.2	12,700	0.4	27,076	0.2	14,432	0.2	15,384	0.2	16,400
Program Coordinator (0.5 FTE at 25% benefits and 6.6 % increase)	98,000	0.5	62,230		66,337		70,715		75,383		80,358
Printed course materials (\$15 per student)	15	15	225	45	675	90	1,350	135	2,025	135	2,025
Marketing and advertising			15,000		15,000		15,000		15,000		15,000
Misc. Operating Costs			9,000		20,000		15,000		15,000		15,000
Other Recovery Costs (Finance, Mgmt costs)					45,000		45,000		50,000		50,000
Total development and delivery costs			180,555		325,241		353,224		378,329		388,381
Number of enrolments			15		45		90		135		135
Income: 2500/course	2,500										
BIU per extra student (.33 of full time student)		15	70,280	45	210,840	90	421,680	135	632,520	135	632,520
Course Income (Only stream courses)		15	112,500	45	337,500	75	656,250	90	787,500	90	787,500
Total Income			182,780		548,340		1,077,930		1,420,020		1,420,020
Central University			0		54,834		215,586		284,004		284,004
Net Income			2,225		168,265		509,120		757,687		747,635
Disbursement of Revenues			Year 1		Year 2		Year 3		Year 4		Year 5
School of Rehabilitation Science			1,113		84,132		254,560		378,844		373,818
School of Business			1,113		84,132		254,560		378,844		373,818

APPENDIX 4: LIST OF CORE FACULTY

Faculty Name	Rank	Home Unit	Area
Baptiste, S	Professor	School of Rehabilitation Science	Leadership, Organizational Development
Bontis, N	Associate Professor	School of Business	Knowledge Management and Business Strategy
Chamberlain, T	Professor	School of Business	Finance
Connelly, C	Assistant Professor	School of Business	Organizational Behaviour and Human Resources Management
Detlor, B	Associate Professor	School of Business	Information Systems
Geddes, L	Associate Clinical Professor	School of Rehabilitation Science	Health administration; Ethics
Hupfer, M	Associate Professor	School of Business	Marketing and Gender Issues
Flynn, T	Assistant Professor	School of Business	Communications and Crisis Management
Jung, B	Assistant Professor	School of Rehabilitation Science	Program evaluation; communication
Law, M	Professor	School of Rehabilitation Science	Research methods; Knowledge Exchange and Transfer; Health Policy
Letts, L	Associate Professor	School of Rehabilitation Science	Research methods; program evaluation
Longo, C	Assistant Professor	School of Business	Health Economics
McAteer, T	Teaching Professor	School of Business	Organizational Behaviour
McCracken, S	Associate Professor	School of Business	Accounting
Mitchell, C	Assistant Clinical Professor	School of Rehabilitation Science	Use of evidence in Health Care
Plews, N	Assistant Clinical Professor	School of Rehabilitation Science	Health administration; Human Resources Management
Randall, G	Assistant Professor	School of Business	Health Policy
Richardson, J	Associate Professor	School of Rehabilitation Science	Research Methods; Use of Evidence in Health Care
Solomon, P	Professor	School of Rehabilitation Science	Interprofessional Collaboration in the Workplace
Stewart, D	Associate Professor	School of Rehabilitation Science	Use of Evidence in Health Care; Leadership
Stillman, P	Sessional Lecturer	School of Business	Contract Law
Stratford, P	Professor	School of Rehabilitation Science	Measurement and Evaluation in Health Services
Taylor, W	Associate Professor	School of Business	Health Services Management
Tremblay, M	Associate Professor	School of Rehabilitation Science	Research Methods; Disability Policy
Tryssenaar, J	Associate Professor	School of Rehabilitation Science	Leadership; Mental Health in Workplace
Wakefield, P	Assistant Professor	School of Business	Marketing
Wilkins, S	Associate Professor	School of Rehabilitation Science	Health Administration; Human Resource Management; Research Methods

10/14/2008

McMaster University Faculty of Health Sciences

Proposal

New Field

Advanced Practice Nursing

&

Change of Current Field

Leadership & Practice TO Leadership

Nursing Graduate Program

October 9, 2008

DRAFT

McMaster University Faculty of Health Sciences

New Field

Advanced Practice Nursing

Objectives and Rationale for New Field and Change of Current Field

The proposed New Field – Advanced Practice Nursing – is intended to more clearly identify the focus and strength of the McMaster University’s Graduate Nursing Program within this area of nursing. The Canadian Nurses Association defines “advanced nursing practice” as:

“an umbrella term to describe an advanced level of clinical nursing practice that maximizes the use of graduate educational preparation, in-depth nursing knowledge and expertise in meeting the health needs of individuals, families, groups, communities and populations. It involves analyzing and synthesizing knowledge; understanding, interpreting and applying nursing theory and research; and developing and advancing nursing knowledge and the profession as a whole.” (CNA, 2008).

Advanced Practice Nursing (APN) is comprised of two roles in Canada: Nurse practitioner (NP) and clinical nurse specialist (CNS). Five categories of key competencies are exhibited by APNs namely, comprehensive clinical care, organizational leadership and change management, education, research, and professional development (Canadian Association of Nurses in Oncology, 2001; International Council of Nurses, 2008).

The CNA (2008) and the International Council of Nurses (2008) agree that the minimum educational preparation for advanced nursing practice is a graduate degree in nursing. The outcome literature on Master's prepared APN roles demonstrates that it is the integration of these role domains (clinical, education, research, leadership), rather than a pure focus on the transfer of medical functions to the APN, that provides the added value to the health care system (enhanced patient outcomes, health care provider outcomes, reduced costs and appropriate use of health services) (Bryant-Lukosius et al. 2004). Master's level education focuses on developing this integrated skill set that is beyond what can be expected to be achieved at the baccalaureate level.

Previously, we submitted a request to OCGS and received approval (February 22, 2007) for five fields; namely, 1) Health of Populations; 2) Wellness and Healing Across the Lifespan; 3) Health Services & Policy; 4) Nursing Leadership & Practice; and 5) Nursing Education. Since this approval, we have continued to reflect on the fit between these fields and our faculty strengths, courses and programs.

We are now requesting that the fourth field Nursing Leadership & Practice, become simply Leadership; and that we create a new sixth field, Advanced Practice Nursing.

This readjustment would mean that all our programs related to Advanced Nursing Practice and any new advanced practice programs that may be developed would be situated within this field. This would enable potential applicants for advanced practice nursing education to readily identify their field of interest. Thus, the OCGS approved programs for Advanced Neonatal Nurse Practitioner (Post Masters), and Primary Health Care Nurse Practitioner (Masters and Post-Masters) would be part of this field.

There is heightened global demand for APN roles in acute, ambulatory, community and home care settings that is expected to continue over the next 10 years (Bryant-Lukosius et al., 2004 & 2007). The School of Nursing at McMaster is recognized as an international leader in this field (Bryant-Lukosius & DiCenso, 2004; DiCenso et al., 2007) and is home to the Canadian Health Services Research Foundation and Canadian Institute of Health Research Chair in APN held by Dr. DiCenso. Formal recognition of this expertise through a designated field of graduate study would facilitate the recruitment of high quality graduate students and faculty and would provide the foundation for further education and research development necessary to meet the increasing demand for APN roles in the health care system.

Core Faculty, Rank, Department and Courses Related to Field

Advanced Practice Nursing

1. Primary Health Nurse Practitioner Program

<u>Name</u>	<u>Rank</u>	<u>Department</u>	<u>FT/PT</u>	<u>Course</u>
Brenda Lammi Connie Mitchell	Faculty	Rehabilitation Sciences	PT	RS 705
Joyce Tryssenaar	Faculty	Rehabilitation Sciences	FT	RS 708
Sheryl Boblin	Associate Professor	SON	FT	RS 708
Eric Staples	Assistant Professor	SON	FT	RS 710
Christine Patterson	Assistant Professor	SON	FT	RS 710

Core Graduate Courses for the Advanced Practice Nursing Field: Primary Health Care Nurse Practitioner (PHCNP) Program

RS 705 – Evaluating Sources of Evidence

RS 708. Reasoning and Decision-Making.

RS 710. Facilitating Learning in Rehabilitation (Nursing) Contexts.

In addition, the PHCNP student takes seven courses through a consortium of nine universities (Council of Ontario University Programs in Nursing - COUPN), and is taught

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by faculty from these universities through a mix of on site and distance education;
namely:

- 1) Advanced Health Assessment and Diagnosis I:
- 2) Advanced Health Assessment and Diagnosis II
- 3) Pathophysiology
- 4) Roles and Responsibilities
- 5) Therapeutics in Primary Health Care I
- 6) Therapeutics in Primary Health Care II
- 7) Integrative Practicum

2. Advanced Neonatal Nurse Practitioner

<u>Name</u>	<u>Rank</u>	<u>Department</u>	<u>FT/PT</u>	<u>Course</u>
Janet Pinelli	Professor	SON	FT	NUR 722
Kathy Cunningham	Assistant Clinical Professor	SON	PT	NUR 720 NUR 721 NUR 722

Also includes faculty and staff from the departments of pediatrics and neonatal division

Core Graduate Courses for the Advanced Practice Field: Advanced Neonatal Nurse Practitioner (ANN)

NUR 720 Advanced Nursing Care of High Risk Infant and Families

NUR 721 Advanced Neonatal Nursing Clinical Practice 1

NUR 722 Advanced Neonatal Nursing Clinical Practice 11

Other Courses Suitable for APN Field

Denise Bryant-Lukosius	Assistant Professor	SON	FT	NUR 706
Alba DiCenso	Professor	SON	FT	NUR 706
Maureen Dobbins	Associate Professor	SON	FT	RS/NUR 725
Heather Arthur	Professor	SON	FT	NUR 712
Donna Ciliska	Professor	SON	FT	NUR 712

NUR 706 Research Issues in the Introduction and Evaluation of Advanced Nursing Practice

RS/NUR 725 Knowledge Exchange and Translation

NUR 712 Evidence Based Health Care

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Other Graduate Faculty with Expertise and Research Interest in APN Field

Sharon Kaasalainen	Assistant Professor	SON	FT
Dyanne Semogas	Assistant Professor	SON	FT
Gina Browne	Professor	SON	FT
Pat Strachan	Assistant Professor	SON	FT
Jennifer Skelly	Associate Professor	SON	FT

Relationship of New Field to Parent Program

The two programs 1) PHCNP and 2) ANN will continue to have the same admission requirements, and degree requirements as previously stated in the OCGS submission. They will continue to require the same courses as previous.

The PHCNP masters student will no longer be conferred a MN degree, but rather will be given a MSc degree as are the other course based students. The post Masters PHCNP student will receive a Graduate Diploma as previously approved by OCGS. The ANN will continue to receive a Graduate Diploma.

There is no change in previously stated projected enrolments.

Change in Current Field

Leadership (from Leadership and Practice)

Core Faculty, Rank, Department and Courses Related to Field

<u>Name</u>	<u>Rank</u>	<u>Department</u>	<u>FT/PT</u>	<u>Course</u>
Colleen McKey	Assistant Professor	SON	FT	NUR 707 NUR 724
Gladys Peachey	Assistant Professor	SON	FT	NUR 707 NUR 724

Other Graduate Faculty with expertise in Leadership Field:

Anita Fisher	Associate Professor	SON	FT
Brenda Flaherty	Assistant Clinical Professor	HHS	PT
Ruth Lee	Assistant Clinical Professor	HHS	PT
Pat Mandy	Assistant Clinical Professor	LHIN	PT

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Core Graduate Courses for the Leadership Field

NUR 707 Theoretical Foundations of Leadership and Management

NUR 724 Theoretical Foundations of Leadership and Organizational Effectiveness

Relationship of Revised Field to Parent Program

Students with a focus on Nursing Leadership will continue to have the same admission requirements, and degree requirements as with other thesis or course based MSc students.

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Memo

To: Dr. Carl Richards
 From: Dr. Margaret Black
 CC:
 Date: October 14, 2008
 Re: Course based MSc – program comparisons

Further to compare the Primary Health Care Nurse Practitioner program and the current course based MSc program

	Core Courses	Electives and Final Requirement
Primary Health Care Nurse Practitioner	Year 1 RS 705 Evaluating Sources of Evidence RS 708. Reasoning and Decision-Making. RS 710. Facilitating Learning in Rehabilitation (Nursing) Contexts. Year 2 Advanced Health Assessment and Diagnosis I: Advanced Health Assessment and Diagnosis II Pathophysiology Roles and Responsibilities Therapeutics in Primary Health Care I Therapeutics in Primary Health Care II Integrative Practicum	No electives Scholarly paper at end of year 1 Then write the RN(EC) exams
Course based MSc	NUR 701 Theoretical Basis of Nursing Practice NUR 711 Advanced Practicum in Nursing HRM 721 Fundamentals of Health Research HRM/NUR 745 Qualitative Research Methods	Three electives Scholarly Paper



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		HRM Program		
COURSE TITLE		Clinical Epidemiology & Biostatistics Genetics		
COURSE NUMBER	HRM 728	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (X)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Sonia Anand		
PREREQUISITE(S)		HRM 701/702 (or equivalent)		
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED: January 2009	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? NO IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE		PROVIDE THE CURRENT COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) <i>Please see #4 on page 2 of this form</i>		
CHANGE TO FULL COURSE		CHANGE TO HALF COURSE	CHANGE TO QUARTER COURSE	
COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:		
OTHER		EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar. Genetic epidemiology overlaps with molecular epidemiology. It is the epidemiological evaluation of the role of inherited causes of disease in families and in populations; it aims to detect the inheritance pattern of a particular disease, localize the gene, and find a marker associated with disease susceptibility. Gene-gene and gene-environment interactions are also studied in genetic epidemiology of a disease. Genetic epidemiology is "a science which deals with the etiology, distribution, and control of disease in groups of relatives and with inherited causes of disease in populations" (Morton NE, 1982).				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used. To provide an introduction and basic understanding of the concepts underlying the new field of genetic epidemiology.				

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>To provide an introduction and basic understanding of the concepts underlying the new field of genetic epidemiology.</p>
<p>2. EXPECTED ENROLMENT:</p> <p>maximum 12 students</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p> <p>Small group seminars/tutorials.</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION: (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p> <p>Course evaluation will be based on class participation, and completion of a mid-term and final assignment. The mid-term assignment is a 5-page review of an area in genetic epidemiology. The final assignment involves the analysis and interpretation of a publicly available genetics dataset.</p> <p>Mark Breakdown -Class Participation: 20% -Mid-term Assignment: 30% -Final Assignment & Presentation: 50%</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p> <p>n/a</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p> <p>n/a</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: Sonia Anand Email: anands@mcmaster.ca Extension: 73488</p>

If you have any questions regarding this form, please contact the Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/December 2006

HRM Course Outline

Course Number & Title:	HRM 728: Clinical Epidemiology & Biostatistics Genetics Course
Course Co-ordinator:	Sonia Anand
Additional Faculty/Support:	May include: Peter Szatmari, Changchun Xie, Mark Loeb, Kevin Zbuk, Gerry Wright, W Haerty

Course Description

Classical epidemiology deals with disease patterns and factors associated with disease causation, with the ultimate aim of preventing disease. Molecular epidemiologic studies measure exposure to specific substances (DNA adducts) and early biological responses (somatic mutations). They evaluate host characteristics (genotype and phenotype) that mediate responses to external agents. Furthermore, they use markers of specific effects (like gene expression) to refine disease categories such as heterogeneity, etiology and prognosis.

Genetic epidemiology overlaps with molecular epidemiology. It is the epidemiological evaluation of the role of inherited causes of disease in families and in populations; it aims to detect the inheritance pattern of a particular disease, localize the gene, and find a marker associated with disease susceptibility. Gene-gene and gene-environment interactions are also studied in genetic epidemiology of a disease. Genetic epidemiology is “a science which deals with the etiology, distribution, and control of disease in groups of relatives and with inherited causes of disease in populations” (Morton NE, 1982).

Course Objectives

To provide an introduction and basic understanding of the concepts underlying the new field of genetic epidemiology.

See attachment for weekly objectives.

Educational Methods/Course Format

This will be a half course offered through the department of CE&B comprised of 10-12 seminars.

Course Text/Materials

The course will consist of a courseware package made up of reference papers to discuss each session <see *attached*>. The readings identified in the outline are not the sole reading material for this course, but, they serve as a starting point to help students explore the topic and widen their horizons. The following textbook is an adjunct to the course - A Statistical Approach to Genetic Epidemiology: Concepts and Applications (Hardcover), by Andreas Ziegler (Author), Inke R. Koenig (Author). This will provide students with additional background information and “depth” in the seminar topic area.

Prerequisites:	HRM 701/702 (or equivalent)
Session	Topic
Week 1	Key Concepts in Genetic Epidemiology
Week 2	Genetic Association Studies
Week 3	Mapping Complex Disease Genes with Linkage Disequilibrium
Week 4	What Makes a Good Genetic Association Study?
Week 5	Epidemiological Methods for Studying Genes and Environmental Factors in Complex Diseases
Week 6	Genetic Epidemiology and Public Health: Hope, Hype, and Future Prospects

Week 7	From Human Genetics and Genomics to Pharmacogenetics and Pharmacogenomics: Past Lessons, Future Directions
Week 8	Functional Genomics: Review of Gene Expression and Molecular Biology Techniques and Interpretation
Week 9	Epigenetics and the Potential Influence of Epigenetic Variation on the Occurrence of Phenotypic Characterization and Disease Causation
Week 10	Rapidly Evolving Changes in Genetic Technology and Their Influence on Research: A View from 20,000 Feet
Week 11	Student Presentations
Week 12	Student Presentations
Week 13	Student Presentations

Evaluation of Student Performance
<p>Course Evaluation: Based on attendance, and completion of a course assignment involving analysis and interpretation of a publicly available genetics dataset.</p> <p>Course evaluation will be based on class participation, and completion of a mid-term and final assignment. The mid-term assignment is a 5-page review of an area in genetic epidemiology. The final assignment involves the analysis and interpretation of a publicly available genetics dataset.</p> <p>Mark Breakdown -Class Participation: 20% -Mid-term Assignment: 30% -Final Assignment & Presentation: 50%</p>

Outline of the Clinical Epidemiology and Biostatistics Genetics Course

Prepared by: Sonia Anand

Target Students: HRM Graduate Students or other Health Sciences Students

This will be a half course offered through the department of CE&B comprised of 10-12 seminars.

Course Evaluation: Based on Participation, and Completion of course assignments. The mid-term assignment is a 5-page review of an area in genetic epidemiology. The final assignment involves the analysis and interpretation of a publicly available genetics dataset.

1. Key concepts in genetic epidemiology

Reference Paper: *Burton PR, Tobin MD, Hopper JL. Lancet 2005 Sep 10-16;366(9489):941-951.*

Classical epidemiology deals with disease patterns and factors associated with disease causation, with the ultimate aim of preventing disease. Molecular epidemiologic studies measure exposure to specific substances (DNA adducts) and early biological responses (somatic mutations). They evaluate host characteristics (genotype and phenotype) that mediate responses to external agents. Furthermore, they use markers of specific effects (like gene expression) to refine disease categories such as heterogeneity, etiology and prognosis.

Genetic epidemiology overlaps with molecular epidemiology. It is the epidemiological evaluation of the role of inherited causes of disease in families and in populations; it aims to detect the inheritance pattern of a particular disease, localize the gene, and find a marker associated with disease susceptibility. Gene-gene and gene-environment interactions are also studied in genetic epidemiology of a disease. Genetic epidemiology is “a science which deals with the etiology, distribution, and control of disease in groups of relatives and with inherited causes of disease in populations” (Morton NE, 1982).

In this introductory seminar, the central concepts and issues in modern genetic epidemiology will be reviewed. Students will be provided with an overall framework for investigating the role of genetic determinants and the causation of complex diseases such as type 2 diabetes. The framework will outline the integration of modern genetics and population science, which came together to form the field of genetic epidemiology. Students will be provided with the basic concepts and vocabulary needed to understand discoveries of methods and error in the field of genetic epidemiology.

2. Genetic association studies

Reference Paper: *Cordell HJ, Clayton DG. Lancet 2005 Sep 24-30;366(9491):1121-1131.*

(A review of the types of genetic association studies including family-based candidate genes studies, and genome wide associations)

The steps in genetic epidemiologic research are:

1. Establishing that there is a genetic component to the disorder.
2. Establishing the relative size of that genetic effect in relation to other sources of variation in disease risk (environmental effects such as intrauterine environment, physical and chemical effects, behavioral and social aspects).
3. Identifying the gene(s) responsible for the genetic component.

All of these can be achieved either in **family** studies (segregation, linkage, association) or in **population** studies (association).

General methods employed in genetic epidemiology:

Genetic risk studies: What is the contribution of genetics as opposed to environment to the trait? Requires family-based, twin/adoption or migrant studies.

Segregation analyses: What does the genetic component look like (oligogenic: “few genes each with a moderate effect”, polygenic: “many genes each with a small effect” etc.)? What is the model of transmission of the genetic trait? Segregation analysis requires multigenerational family trees preferably with more than one affected member.

Linkage studies: What is the location of the disease gene(s)? Linkage studies screen the whole genome and use parametric or nonparametric methods such as allele sharing methods (affected sibling-pairs method) with no assumptions on the mode of inheritance, penetrance or disease allele frequency (the parameters). The underlying principle of linkage studies is the co-segregation of two genes (one of which is the disease locus).

Association studies: What is the allele associated with the disease susceptibility? The principle is the coexistence of the same marker on the same chromosome in affected individuals (due to linkage disequilibrium). Association studies may be family-based (transmission / disequilibrium test - TDT; also called transmission distortion test) or population-based. Alleles, haplotypes or evolutionary-based haplotype groups may be used in association studies (Clark, 2004; Tzeng, 2005). More recently, genome-wide association studies (GWAS) have become possible (Clark, 2005; Wang, 2005; Pearson, 2008; McCarthy, 2008; WTCCC GWAS; recent GWAS in OEGE). The samples needed for these studies may be nuclear families (index case and parents), affected relative pairs (sibs, cousins, any two members of the family), extended pedigrees, twins (monozygotic and dizygotic) or unrelated population samples.

This seminar will discuss methods of design and analysis of genetic association studies and review the rationale behind them. The similarities and differences between genetic association studies and classical epidemiologic studies of environmental risk factors will be highlighted. Association studies differ from linkage studies and these differences will also be reviewed. Issues of design, statistical analysis and interpretation will be discussed.

3. Mapping complex disease genes with linkage disequilibrium

Reference Paper: *Palmer LJ, Cardon LR. Lancet 2005 Oct 1;366(9492):1223-1234.*

(A review of complex diseases and linkage disequilibrium)

In this overview the technology for detecting and genotyping single nucleotide polymorphisms (SNPs) will be reviewed. Current population based maps of correlation among SNPs, known as linkage disequilibrium (LD), will be discussed and applications to the discovery of genes for complex human diseases reviewed. While linkage studies rely on recombination, **linkage disequilibrium** is the foundation of **association studies**. The assumption is that the genetic marker studied is close enough to the actual disease gene to result in an allelic association at the population level (Jorde, 2000; Weiss, 2002; Carlson, 2004; Morton, 2005). Another critical assumption of both association and LD mapping is that there is little allelic heterogeneity within loci. The magnitude of LD is affected by many factors but if everything else is assumed to be equal, the most important factor is the physical/genetic distance between the disease and marker alleles: the closer they are, the

lower the recombination frequency and the stronger the magnitude of LD. This implies that close linkage between the marker and disease loci would result in longer periods of LD within the population. Linkage is not required for LD to be detectable; allelic or gametic association is a better term to describe the general phenomenon of LD. See *Basic Population Genetics* for more on LD.

The importance of very large sample sizes for studying modest genetic effects will be discussed. Knowledge regarding the structure of the human genome as related to the SNPs and linkage disequilibrium will be reviewed. Additionally, the potential application of this knowledge to mapping complex disease genes, especially in relationship to whole genome associations scanning, will be discussed.

4. What makes a good genetic association study?

Reference Paper: *Hattersley AT, McCarthy MI. Lancet 2005 Oct 8;366(9493):1315-1323.*
(A review of the potential bias in genetic association studies)

Association studies focus on population frequencies, whereas linkage studies focus on concordant inheritance. One may be able to detect linkage without association when there are many independent trait-causing chromosomes in a population (i.e., no LD of the disease causing allele to a specific marker nearby). Association without linkage is observed when an allele explains only a minor proportion of the variance for a trait, so that the allele may occur more often in affected individuals but does a poor job of predicting disease status within a pedigree (Lander & Schork, 1994). Association is usually with a “susceptibility” locus, which increases the probability of contracting the disease but is not “necessary” or “sufficient” for disease expression. In this case, the marker will not show linkage in families. If an association is, however, with a marker in LD with a “necessary” locus for disease development, then there will be evidence for linkage in family data (Greenberg, 1993; Greenberg & Doneshka, 1996). Linkage analysis is not useful for finding loci that are neither necessary nor sufficient for disease expression (so-called susceptibility loci).

Association studies have several practical advantages over linkage studies. As opposed to linkage studies, families with multiple affected individuals are not required and no assumptions are made about the mode of inheritance of the disease. In addition, association studies have considerable statistical power to detect genes of weak effects unlike linkage studies in families (Risch, 1996; Morton, 1998; Risch, 2000). Most significant factors independently associated with increased success in linkage studies are (a) an increase in the number of individuals studied and (b) study of a sample drawn from only one ethnic group (Altmuller, 2001). For association studies, large datasets, small *P* values and independent replication of results are important for reproducible results (Editorial, *Nat Genet* 1999; Dahlman, 2002). Use of ancestral haplotype groups in association studies (evolutionary-based association study design) is another way to increase power (Templeton, 1987; 1995; 2000; Schork, 1998; Seltman, 2003; Fejerman, 2004; Tzeng, 2005).

Possible ascertainment problems in case-control studies in genetic epidemiology:

- The sample should be representative of all cases. Inclusion of those identified at a hospital clinic may or may not be appropriate. They should be unrelated, incident (as opposed to prevalent) and consecutively diagnosed ones. If the prevalence of the disease is known, this would give an idea for the completeness of ascertainment (for a rare disease).

- If the disease requires medical attention only in some cases, recruitment from a hospital will be selective (usually for severe cases).
- If there is a survival effect of the disease (as in Alzheimer's disease and ApoE), and if the associated allele also modifies the risk of death from competing causes, the age-dependent frequencies will be different. In this case, age-matching of cases and controls becomes particularly important.
- The controls should be comparable to cases except for having the disease. Local, contemporary controls should be selected via the same routes as the cases. For relevant diseases, age- and sex-matching (by frequency or one-to-one) may be important. Self-selected controls, such like volunteer marrow or blood donors, are not ideal. Controls that are truly population-based controls are more acceptable.

The pitfalls of conventional epidemiologic studies, such as selection bias, information bias, and confounding, apply equally to molecular epidemiological research (Vineis & McMichael, 1998; Campbell, 2002; Boffetta, 2003). Association studies also face additional problems unique to genetic studies (Olson, 2000; Cordell, 2000; Elbaz & Alperovitch, 2002; Lee & Ho, 2003; Morimoto, 2003; Potter, 2003). In genetic association studies, missing data may be distributed differentially between cases and controls and may generate spurious associations (Clayton, 2005). This bias may be due to having subsets of DNA samples extracted using different chemistries that influence the performance of the assay differentially. See *Pitfalls in Genetic Association Studies*.

One potential problem is that estimates of genetic effect are subject to confounding when cases and controls differ in their ethnic backgrounds (population stratification bias or confounding by ethnicity). This can occur when both disease risk and genetic mutation frequencies vary among ethnic groups (Thomas, 2002; Wacholder, 2002; Cardon, 2003). To avoid the problem of population stratification bias, matching cases to controls on ethnic background, stratification, multidimensional scaling, family-based association studies or genomic controls (Devlin, 1999; Pritchard, 1999) can be used.

5. Epidemiological methods for studying genes and environmental factors in complex diseases

Reference Papers:

(a) Clayton D, McKeigue PM. *Lancet* 2001 Oct 20;358(9290):1356-1360.

(b) Marchini J, Donnelly P, Cardon LR. *Genome-wide strategies for detecting multiple loci that influence complex diseases. Nat.Genet.* 2005 Apr;37(4):413-417.

(A study of inter-genetic interactions both gene to environmental interactions and gene-gene interactions.)

Genetic epidemiology of complex diseases

The term “complex trait/disease” refers to any phenotype that does not exhibit classical Mendelian inheritance attributable to a single gene; nevertheless, they may exhibit familial tendencies (familial clustering, concordance among relatives). The contrast between Mendelian diseases and complex diseases involves more than just a clear or unclear mode of inheritance. In Mendelian diseases, the risk to relatives decreases by a factor of $\frac{1}{2}$ with each degree of relationship (from first to second to third degree) but in complex diseases the risk decreases more rapidly (Risch, 1990a). Other hallmarks of complex diseases include known or suspected environmental risk factors; seasonal, birth order, and cohort effects; late or variable age of onset; and variable disease progression. Many complex diseases are hard to diagnose accurately; even quantitative traits such as hypertension often involve sizable measurement errors (Guo, 2000b). Ultimate analysis of complex traits requires sophisticated statistical designs incorporating all genetic and nongenetic variables, their interactions, and

familial correlations. In general, linkage is harder to show in a complex disease than a Mendelian disorder (Risch, 1992). A complex disease can be modeled in two different ways: (1) an additive model, closely approximates genetic heterogeneity, is characterized by no interlocus interaction, and (2) a multiplicative model, representing epistasis (interaction) among loci (Risch, 1990a).

Common susceptibility alleles in rare complex diseases

One popular hypothesis proposes that the genetic factors underlying common diseases will be alleles that are themselves quite common in the population at large (Lander, 1996; Chakravarti, 1999); Pritchard, 2001). When several different loci contribute to a phenotype (such as a complex disease), it is likely that the alleles at loci responsible for such interactions have high frequencies in populations (Carlson, 2004). If, for example, six genes contribute equally to a disease with an incidence of 1.5%, each susceptibility allele must have a population frequency of around 50%. Thus, modest-risk gene variants involved in polygenic diseases are often likely to be normal alleles from unsuspected loci that have relatively high frequencies (Reich, 2001). The identification of normal polymorphisms is of great importance for medical genetics (Cavalli-Sforza, 1998). However, rare coding region alleles are commonly deleterious and their contribution to the development of complex diseases is obvious (Kryukov et al, 2007; see also Ropers, 2007).

Concepts reviewed in this Seminar include the importance of study design and potential threats to validity including sample recruitment and selection, genotyping error, potential errors in data analysis, the importance of replication, and population structure will be reviewed.

6. Genetic Epidemiology and Public Health: hope, hype, and future prospects

Reference Paper: *Davey Smith G, Ebrahim S, Lewis S, Hansell AL, Palmer LJ, Burton PR.. Lancet 2005 Oct 22-28;366(9495):1484-1498.*

Personalized medicine is the use of information and data from a patient's genotype, or level of gene expression, to stratify disease, select a medication, provide a therapy, or initiate a preventative measure that is particularly suited to the patient at the time of administration. Personalized medicine makes it possible to give: "the appropriate drug, at the appropriate dose, to the appropriate patient, at the appropriate time." The benefits of this approach are in its accuracy, efficacy, safety and speed. The term emerged in the late 1990s with progress in the Human Genome Project. Biomedical research findings over the past decade have unfolded a series of new, predictive sciences that share the appendage *-omics* (genomics, proteomics, lipidomics, metabolomics, cytomics). These fields have the potential to drive a new approach to drug development. They also hold promise for developing significantly more effective diagnosis, therapeutics, and patient care. Laboratories that support personalized molecular medicine develop patient-specific tests that monitor the effectiveness of treatment. Consequently, they can identify the recurrence of disease far earlier than was once possible.

The concept of personalized medical care, based on molecular genetic testing and its future potential, will be reviewed in this seminar. The contribution of genetic epidemiology to establish causal nature of gene as well as gene-gene in gene-environment interactions on disease etiology, and the potential of understanding these causal pathways in developing a prevention strategy for common complex diseases will be reviewed.

7. From Human Genetics and Genomics to Pharmacogenomics and Pharmacogenomics: Past Lessons, Future Directions

Reference Papers:

(a) Nebert DW, Zhang G, Vesell ES. From human genetics and genomics to pharmacogenetics and pharmacogenomics: past lessons, future directions. *Drug Metab.Rev.* 2008;40(2):187-224.

(b) Evans WE, Relling MV. Moving towards individualized medicine with pharmacogenomics. *Nature* 2004 May 27;429(6990):464-468.

Pharmacogenomics is a science that examines the inherited variations in genes that dictate drug metabolism and response. It explores the ways these variations can be used to predict whether a patient will have a positive, negative, or absent response to a drug. The way a person responds to a drug, whether positively or negatively, is a complex trait that is influenced by many different genes. In the past, scientists found it difficult to develop genetic tests to predict drug response because the associated genes were not yet known. Once scientists discovered that people's genes show small **variations** in their **nucleotide** content, all of that changed; genetic testing for predicting drug response is now possible. Currently, there is still no simple way to determine how individuals will respond to a medication. Thus, pharmaceutical companies are limited to developing drugs using a "one size fits all" system.

SNP screenings will benefit drug development and testing. Using, pharmacogenomic screening, pharmaceutical companies will be able to identify individuals for whom the drug would be harmful or ineffective. By excluding these people from clinical trials, the drug will be more likely to demonstrate its usefulness in a population group. It will thus increase its chances for success in the marketplace. Pre-screening subjects should also allow clinical trials to be smaller, faster, and therefore less expensive; therefore, the consumer could benefit in reduced drug costs. Finally, the ability to assess an individual's reaction to a drug before it is prescribed will increase a physician's confidence in prescribing the drug and the patient's confidence in taking the drug. This in turn should encourage the development of new drugs tested in a similar manner.

In this seminar, the emerging discipline of pharmacogenomics/genetics will be discussed, and examples of pharmacogenomics used in medicine today (i.e. genotype testing and the use of warfarin) will be provided.

8. Functional genomics: review of gene expression and molecular biology techniques and interpretation

Reference papers:

(a) Lopez-Maury, L. *Nat. Rev. Genet.* 2008 Aug (9);583-593

(b) Quackenbush J. *Computational analysis of microarray data. Nat.Rev.Genet.* 2001 Jun;2(6):418-427.

Functional genomics is a field of molecular biology that uses the data produced by genomic projects, such as genome sequencing projects, to describe gene and protein functions and interactions. Unlike genomics and proteomics, functional genomics focuses on the dynamic aspects of genomic information, such as gene transcription, translation, and protein-protein interactions, as opposed to the static aspects, such as DNA sequence or structures.

Functional genomics uses high-throughput techniques to characterize gene products such as mRNA and proteins. Some typical technology platforms include:

- DNA microarrays and SAGE for mRNA
- Two-dimensional gel electrophoresis and mass spectrometry for protein

Because of the large quantity of data produced by these techniques, bioinformatics is crucial to this type of analysis. Examples of techniques in this class include, data clustering or principal component analysis for unsupervised machine learning (class detection) as well as artificial neural networks or support vector machines for supervised machine learning (class prediction, classification).

This seminar will include a review of computational genetics. An overview of current sophisticated computational tools will be presented. The methods used to analyze large volumes of data and the influence of these factors on the interpretation of the results will be reviewed in reference to *Computational Analysis of Microarray Data* (Quakenbush, 2001).

9. Epigenetics and the potential influence of epigenetic variation on the occurrence of phenotypic characterization and disease causation

Reference Papers:

- (a) Fazzari MJ, Greally JM. *Epigenomics: beyond CpG islands. Nat.Rev.Genet. 2004 Jun;5(6):446-455.*
- (b) Gozmyer, P. *Epigenetics Pioneering the path from methylation to transcription Nature Reviews Genetics Vol 9 326-326 May 2008*

Epigenetics refers to changes in gene expression. Its molecular basis involves modifying the activation of certain genes without changing the basic structure of DNA. Additionally, the chromatin proteins associated with DNA may be activated or silenced. Epigenetic changes are preserved when cells divide. Most epigenetic changes only occur within the course of an individual organism's lifetime, while some are inherited. Specific epigenetic processes include paramutation, bookmarking, imprinting, gene silencing, and X chromosome inactivation.

Epigenetic research uses a wide range of molecular biologic techniques, such as chromatin immunoprecipitation and DNA adenine methyltransferase identification (DamID). Furthermore, bioinformatic methods are playing an increasing role in computational epigenetics.

DNA methylation and chromatin remodeling

Because the phenotype of a cell or individual is affected by which of its genes are transcribed, heritable transcription states can give rise to epigenetic effects. Gene expression is regulated on several levels. One way that genes are regulated is through chromatin remodeling. If the way that DNA is wrapped around the histones changes, gene expression can change as well. Chromatin remodeling is initiated by one of two methods:

1. **Post translational modification of histone amino acids:** Post translational modifications change the shape of the histone sphere. DNA is not completely unwound during replication. It is possible, then, that modified histones may be carried into each new copy of the DNA. Once there, these histones may act as templates, initiating the surrounding new histones to be shaped in the new way. By altering the shape of the histones around it, these modified histones would ensure that a differentiated cell would remain differentiated, and revert into a stem cell.
2. **Addition of methyl groups to the DNA:** Methyl groups are added to CpG sites, in order to convert cytosine to 5-methylcytosine. In effect, the gene is turned off.

Chromosomal regions can adopt stable and heritable alternative states resulting in bistable gene expression without changes to the DNA sequence. Epigenetic control is often associated with alternative covalent modifications of histones. The stability and heritability of states of larger chromosomal regions are often thought to involve positive feedback, in which modified nucleosomes recruit enzymes that similarly modify nearby nucleosomes. Because DNA methylation and chromatin remodeling play such a central role in many types of epigenetic inheritance, the word "epigenetics" is sometimes used as a synonym for these processes. However, this can be misleading. Chromatin remodeling is not always inherited, and not all epigenetic inheritance involves chromatin remodeling.

In this seminar, examples of epigenetic phenomenon influencing these outcomes will be reviewed. The potential limitations of techniques used for epigenetic analyses including issues such as reproducibility or epigenetic measures will also be discussed.

**10. Rapidly evolving changes in genetic technology and their influence on research:
a view from 20,000 feet**

The future prospects of population genomics and its application to complex diseases will be discussed within the framework of genetic epidemiology. The potential to understand the causes of disease by studying environmental and genetic factors will be considered, and various study designs will be reviewed. Furthermore, unique designs using rapidly changing technology that enable the study of pharmacogenomics and epigenetics, will also be highlighted. Finally, the potential for disease prevention using a genome based personalized medicine approach versus the traditional public health approach will be debated and discussed.

Clinical Epidemiology and Biostatistics Genetics Course – Seminars

Seminar	Presenter
1. Key Concepts in Genetic Epidemiology	Dr. Sonia Anand
2. Genetic Association Studies	? Dr. P Szatmari
3. Mapping Complex Disease Genes with Linkage Disequilibrium	? Dr. Changchun Xie
4. What Makes a Good Genetic Association Study?	Dr. Sonia Anand
5. Epidemiological Methods for Studying Genes and Environmental Factors in Complex Diseases	? Dr. Mark Loeb
6. Genetic Epidemiology and Public Health: Hope, Hype, and Future Prospects	Dr. Sonia Anand
7. From Human Genetics and Genomics to Pharmacogenetics and Pharmacogenomics: Past Lessons, Future Directions	? Dr. Kevin Zbuk
8. Functional Genomics: Review of Gene Expression and Molecular Biology Techniques and Interpretation	Dr. Gerry Wright
9. Epigenetics and the Potential Influence of Epigenetic Variation on the Occurrence of Phenotypic Characterization and Disease Causation	? Dr. W. Haerty
10. Rapidly Evolving Changes in Genetic Technology and Their Influence on Research: A View from 20,000 Feet	Dr. Sonia Anand

Online Resources

[Wellcome Trust Centre for Human Genetics: Course on the Design and Analysis of Disease-Marker Association Studies](#)

[Wellcome Trust Genome Sequence & Variation Course Manual \(2003\) \(Other Course Manuals\)](#)

[Genetic Epidemiology Course Lectures by David Clayton](#)

[EFG: Statistical Genetic Analysis of Complex Phenotypes Course Notes \(2005\) incl. Case-Control Association Studies by CM Lewis](#)

[Statistical Methods in Genetic Epidemiology Course \(ST115\) by Ivan Iachin](#)

[Introduction to Genetic Linkage and Association Course Notes by Dave Curtis](#)

[Genetic Epidemiology SuperLecture by Kevin Kip](#)

[Introduction to Genetic Epidemiology Lecture by Hermine Maes](#)

[Human Molecular Genetics \(Strachan & Read; 1999\): Genetic Mapping of Complex Characters & Complex Disease Genetics](#)

[Centre for Integrated Genomic Medical Research \(CIGMR\): Statistical Genetic Analysis](#)

[GENESTAT: Genetic Association Studies Portal](#)

[CDC Genomics and Disease Prevention Center: Research Methods Publications](#)

[Basic Molecular Genetics for Epidemiologists](#)

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[NIH National Human Genome Research Institute Programs \(HapMap; ENCODE; Genetic Variation\)](#)

[HapMap Webcast](#)

[HapMap User Guide](#)

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[Glossary on Genetic Epidemiology: Basic & Advanced](#)

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[STROBE \(STrengthening the Reporting of OBServational studies in Epidemiology\) & Checklists](#)

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SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for ALL course changes. All sections of this form must be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		Medical Sciences		
COURSE TITLE		Principles of pre-clinical drug discovery		
COURSE NUMBER	MS760	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE ()	QUARTER (MODULE) ()
INSTRUCTOR(S)		D.J. Crankshaw		
PREREQUISITE(S)				
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? If YES, PROVIDE THE DATE:		
Will the course be <u>CROSS-LISTED</u> with another department? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE		PROVIDE THE CURRENT COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) <i>Please see #4 on page 2 of this form</i>		
CHANGE TO FULL COURSE		CHANGE TO HALF COURSE	CHANGE TO QUARTER COURSE	
COURSE CANCELLATION	<input checked="" type="checkbox"/>	PROVIDE THE REASON FOR COURSE CANCELLATION: Course instructor has competing responsibilities		
OTHER		EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (<i>maximum 6 lines</i>) to be included in the Graduate Calendar.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.				

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)
2. EXPECTED ENROLMENT:
3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):
4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION: (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)
5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).
6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?
PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:
Name: D.J. Crankshaw Email: cranksha@mcmaster.ca Extension: 22759 Date: 2008.06.03

If you have any questions regarding this form, please contact the Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/December 2006

PROGRAM:	DEPT	STATUS	Membership Type	FUNDING
Health Research Methodology				
Dr. Maureen Dobbins	SON	Assoc. Prof. / Appt. In RS	<u>Assoc. Membership</u> : Supervisory Privileges at the PhD level - courses & Committees	
Dr. George Heckman	Med	Assoc. Prof.	<u>Assoc. Membership</u> : Supervisory Privileges at the MSc level; PhD courses & committees	
Dr. Andrew Worster	Med	Assoc. Prof.	<u>Assoc. Membership</u> : Addition of PhD Supervision to Grad Faculty status	
Dr. Homa Keshavarz	CE&B	Asst. Prof. (p/t)	<u>Assoc. Membership</u> : Supervisory Privileges at the MSc level - courses & Committees	
Diane Heels-Ansdell	CE&B	Asst. Professor (p/t)	Courses & Committees at the MSc level	
Anita Gross	SRS	Assoc. Clinical Prof.	<u>Assoc. Membership</u> : Supervisory Privileges at the MSc level - courses & Committees	
Dr. Mark Oremus	CE&B	Asst. Professor	Addition of PhD Supervision to Grad Faculty status	
Dr. Paul Keith	Med	Assoc. Prof.	<u>Assoc. Membership</u> : Supervisory Privileges at the PhD level - courses & Committees	
Dr. Kathy Georgiades	PBN	Asst. Professor	<u>Assoc. Membership</u> : Supervisory Privileges at the PhD& MSc levels - courses & Committees	
Dr. Marc de Somer	CE&B	Asst. Professor (p/t)	Supervisory Privileges at the PhD& MSc levels - courses & Committees	
Dr. Susan Jack	SON	Asst. Prof.	<u>Assoc. Membership</u> : Supervisory Privileges at the PhD& MSc levels - courses & Committees	
Medical Sciences				
Dr. Karen Beattie (PP)	Med	Assistant Professor	Full Membership	Conditional upon obtaining 2 yrs external funding for supervision
Dr. Lori Burrows (II)	BBS	Assoc. Professor	Assoc. Membership	
Dr. David William Molloy (NBS)	Med	Professor	Full Membership	
Dr. Premek Bercik (PP)	Med	Asst. Prof.	Full Membership	
Dr. Gregory Steinberg (BV)	Med	Assoc. Professor	Full Membership	Conditional upon obtaining 2 yrs external funding for supervision
Rehabilitation Science				
Dr. Gillian King	SRS	Assoc. (Clinical) Prof	Addition of courses and committees at the PhD level	