

54 Neurology and Neurosurgery

Graduate Program in Neurological Sciences
Division of Neuroscience
Department of Neurology and Neurosurgery
Departments of Ophthalmology and Psychiatry
Montreal Neurological Institute, Room 141
3801 University Street
Montreal, QC H3A 2B4
Canada

Telephone: (514) 398-1905/ 398-1229

Fax: (514) 398-4621

Email: monique.ledermann@mcgill.ca/ GPNS@mni.mcgill.ca

Website: <http://www.mcgill.ca/gpns/index.html>

Chair, Graduate Program in Neurological Sciences — H. Durham

Chair, Department of Neurology and Neurosurgery —
R. Riopelle

54.1 Staff

Emeritus Professors

D.W. Baxter, G. Bertrand, P. Gloor, J.P. Robb

Professors

A. Aguayo; M.D.(Cordoba Natn.), F.R.C.P.(C)
E. Andermann; M.D., C.M., M.Sc., Ph.D.(McG.)
F. Andermann; B.A.(Paris), B.Sc., (McG.), M.D.(Montr.),
F.R.C.P.(C)
J. Antel; M.D., B.Sc.(Man.), F.R.C.P.(C)
D. Arnold; B.Sc., M.D.(C'nell), F.R.C.P.(C) (*James McGill
Professor*)
M. Avoli; M.D.(Rome), Ph.D.(McG.)
A. Beaudet; B.A., M.D., Ph.D.(Mont.)
C. Bourque; B.Sc.(Ott.), Ph.D.(McG.)
G. Bray; B.Sc.(Bran.), M.D., B.Sc., (Man.), F.R.C.P.(C)
S. Carbonetto; M.Sc.(Mass.), Ph.D.(N.Carolina)
R. Del Maestro; M.D.(W. Ont.), Ph.D.(Uppsala), F.R.C.S.(C),
D.A.B.N.S., F.A.C.S.
M. Diksic; B.Sc., Ph.D.(Zagreb)
P. Drapeau; B.Sc., Ph.D.(McG.)
J.R. Dunn; B.Sc., Ph.D.(U.B.C.)
H. Durham; M.Sc.(W. Ont.), Ph.D.(Alta.)
A. Evans; M.Sc.(Sur.), Ph.D.(Leeds)
W.H. Feindel; O.C., B.A.(Acad.), M.D., C.M.(McG.), M.Sc.(Dal.),
D.Sc.(Acad. and McG.), D.Phil.(Oxon.), F.R.C.S.(C), F.A.C.S.,
F.R.S.C.
S.G. Gauthier; B.A., M.D.(Montr.), F.R.C.P.(C)
J. Gotman; M.Eng.(Dart.), Ph.D.(McG.)
D. Guittou; Dipl. IVK(U. Libre de Brux.), B.Eng., M.Eng.,
Ph.D.Eng., Ph.D.Physiol.(McG.)
E. Hamel; B.Sc.(Sher.), Ph.D.(Montr.)
P.C. Holland; B.A.(Lanc.), Ph.D.(N'cle)
B. Jones; B.A., M.A., Ph.D.(Delaware)
M. Jones-Gotman; B.A.(Calif.), M.A., Ph.D.(McG.)
J.-P. Julien; B.Sc.,(Que.), Ph.D.(McG.)
D. Kaplan; B.A.(Clark), Ph.D.(Harv.)
G. Karpati; M.D.(Dal.), F.R.C.P.(C)
D. Lawrence; B.Sc.(Bishop's), M.Sc., M.D., C.M.(McG.),
F.R.C.P.(C)
R. Leblanc; M.Sc.(McG.), M.D.(Ott.), F.R.C.S.(C)
F. Miller; B.Sc.(Sask.), Ph.D.(Calg.)
B. Milner; B.A., Sc.D.(Cantab.), Ph.D.(McG.)
G. Mohr; M.D.(Stras.)
A. Olivier; M.D.(Montr.), Ph.D.(Laval), F.R.C.S.(C)
T. Owens; M.Sc.(McG.), Ph.D.(Ott.)
Y. Patel; M.B., Ch.B.(Otago), Ph.D.(Monash), F.R.A.C.P.,
F.R.C.P.(C)
M. Petrides; B.Sc., M.Sc.(Lond.), Ph.D.(Cantab.) (*James McGill
Professor*)
M. Rasminsky; B.A.(Tor.), M.D.(Harv.), Ph.D.(Lond.), F.R.C.P.(C)
J. Richardson; B.Sc., M.D., C.M., Ph.D.(McG.), F.R.C.P.(C)
R.J. Riopelle; M.D.(Ott.), F.R.C.P.(C)

G. Rouleau; M.D.(Ott.), F.R.C.P. (C)
E. Shoubridge; M.Sc., Ph.D.(U.B.C.)
J.D. Stewart; B.Sc.(Lond.), M.B., B.S.(W.I.), F.R.C.P.(C)
J.G. Stratford; M.D., C.M., M.Sc.(McG.), F.R.C.S.(C), F.A.C.S.
G. Tannenbaum; M.Sc., Ph.D.(McG.)
C. Thompson; M.Sc., D.Sc.(N.Z.)
G. Watters; B.A.(Minn.), M.D.(Man.), F.R.C.P.(C)
R.J. Zatorre; A.B.(Boston), M.Sc., Ph.D.(Brown)

Associate Professors

A. Alonso; M.S.(Barcelona), Ph.D.(Madrid)
M. Aubé; B.A., M.D.(Montr.), F.R.C.P.(C)
P. Barker; Ph.D.(Alta.), B.Sc.(S. Fraser)
S. Bekhor; M.B., Ch.B.(Baghdad), F.R.C.P.(C)
J. Carlton; B.S., M.D.(Johns H.), F.R.C.P.(C)
C. Chalk; B.Sc.(Queen's), M.D., C.M.(McG.) F.R.C.P. (C)
H. Chertkow; M.D.(W. Ont.), F.R.C.P.(C)
R. Cote; M.D.(Montr.), F.R.C.P.(C)
S. David; Ph.D.(Man.)
R. Del Carpio; M.D.(Lima), F.R.C.P.(C)
F. Dubeau; M.D.(Montr.), F.R.C.P.(C)
J.P. Farmer; M.D., M.Sc.(McG.), F.R.C.P.(C)
K. Hastings; B.Sc., Ph.D.(McG.)
Y. Lapierre; B.A., M.D.(Montr.), F.R.C.P.(C)
A. Leblanc; M.Sc.(Moncton), Ph.D.(Dal.)
I. Libman; B.A., M.D., C.M.(McG.), F.R.C.P.(C)
P. McPherson; M.Sc.(Man.), Ph.D.(Iowa) (*William Dawson
Scholar*)
D. Melançon; B.A., M.D.(Montr.)
C. Melmed; B.Sc., M.D.(Man.), F.R.C.P.(C)
J. Montes; B.Sc.(Inst.Pot.-Mex.), M.D.(Uoio.Auto.de San Luis
Pot.-Mex)
J. Nalbantoglu; B.Sc., Ph.D.(McG.)
A. O'Gorman; M.D.(Ireland)
A. Peterson; B.Sc.(Vic., B.C.), Ph.D.(U.B.C.)
B. Pike; B.Eng.(Mem.), M.Eng., Ph.D. (McG.) (*William Dawson
Scholar*)
A. Ptitio; Ph.D.(Montr.)
L.F. Quesney; B.Sc., M.D.(Chile), Ph.D.(McG.)
B. Rosenblatt; B.Sc., M.D., C.M.(McG.), F.R.C.P.(C)
A. Sadikot; M.D.,C.M.(McG.), Ph.D.(Laval), F.R.C.S. (C)
G. Savard; M.D.(Montr.), F.R.C.P.(C)
H. Schipper; M.D., Ph.D.(McG.)
R. Schondorf; M.Sc., Ph.D., M.D.,C.M.(McG.), F.R.C.P.(C)
P. Séguéla; Ph.D.(Bord.), Ph.D.(Montr.)
M. Shevell; B.Sc., M.D.(Vanderbilt)
W. Sossin; S.B.(M.I.T.), Ph.D.(Stan.)
S. Stifani; Ph.D.(Rome); Ph.D.(Alta)
D. Tampieri; M.D.(Bologna)
J. Teitelbaum; M.D.(U. Montr.), F.R.C.P.(C)
J. Woods; M.B., B.Ch.(Dub.), M.Sc.(McG.), F.R.C.P.(C)

Assistant Professors

M. Angle; M.D., C.M.(McG.), F.R.C.P.(C)
A. Bar-Or; M.D.,C.M.(McG.); F.R.C.P.(C), D.A.B.N.P.
A. Bernasconi; M.D.(Basel U.)
M.A. Castro-Alamancos; B.Sc., M.Sc., Ph.D.(U. Complutense of
Madrid)
L. Collins; M.Eng., Ph.D.(McG.)
A. Dagher; M.Eng.(McG.), M.D.(Tor.), F.R.C.P.(C)
M.-E. Dilenge; M.D.(Sher.), F.R.C.P.(C)
L. Durcan; M.D.(Man.), F.R.C.P.(C)
M. Ferns; B.Sc.(Otago), Ph.D.(W. Aust.)
E. Fon; M.D.(Montr.), F.R.C.P. (C)
D. Gendron; M.D.(Laval), F.R.C.P.(C)
A. Genge; B.Sc.(Dal.), B.Med.Sc., M.D.(Mem.), F.R.C.P.(C)
W. Gorczyca; M.D., Ph.D.(Poland)
B. Goulet; M.D.(Laval), F.R.C.S.(C)
R. Gunn; Ph.D.(U. Warwick)
L. Jacques; B.Sc.(Laval), M.Sc., M.D.(Montr.), F.R.C.P.(C)
K. Johnston; Ph.D., M.D.(Tor.), F.R.C.S.(C)
T. Kennedy; B.Sc.(McM.), Ph.D.(Col.)
D. Klein; B.A., Ph.D.(U. of Witwatersrand/S. Africa)
A.L. Lafontaine; M.Sc.(McG.), M.D. (McM.), F.R.C.P.(C)

M. Lechter; B.Sc.(McG.), M.D., Ph.D.(Queen's)
 G. Leonard; Ph.D.(McG.)
 M. Maleki, M.D.(Iran), F.R.C.S. (C)
 E. Meyer; M.Sc.(Montr.), Ph.D.(McG.)
 J. Minuk; M.D.(Man.), F.R.C.P.(C)
 S. Mzengeza; M.Sc. (Univ. of East Anglia), Ph.D.(Queen's)
 M. Panisset; M.D.(Montr.)
 H. Paudel; Ph.D.(Okla.), M.Sc.(Nepal)
 T. Paus; M.D.(Purkyne U./Czechoslovakia), Ph.D.(Czech. Acad. of Sciences/Prague)
 C. Poulin; M.D.(Laval), F.R.C.P.(C)
 D. Ragsdale; B.S.(Ill.), Ph.D.(Calif.)
 Y. Rao; B.Sc.(China), Ph.D.(Tor.)
 J.-P. Roy; M.D.(Laval), F.R.C.P.(C)
 J. Rubin; B.Sc., M.D., C.M.(McG.), D.A.M.P.& N.
 F. Salevsky; M.Sc., M.D.(Alta.), F.R.C.P.(C)
 D. Sinclair; M.D.(Dalhousie), F.R.C.S.(C)
 C. Sirard; M.Sc.(Montr.), Ph.D.(Tor.)
 D. Sirhan; M.D.(Montr.), F.R.C.S.(C)
 V. Soland, M.D.(Sher.)
 V. Sziklas, Ph.D.(McG.)
 D. Trojan; M.D.(Conn.)
 M. Veilleux; M.D.(Sher.), F.R.C.P.(C)
 L. Viera, B.Sc.(Waterloo), M.D.(Ott.) F.R.C.S.(C)
 F. Wein, M.D., C.M.(McG.) F.R.C.S. (C)
 T. Wein; M.D.(Vermont U.), F.R.C.P.(C)

Lecturers

S. Chouinard; M.D.(Montr.), F.R.C.P.(C)
 D. Diorio; M.D.(Tor.), M.Sc.(McG.)
 T. Stroh; Ph.D.(Max Planck Inst.)
 W. Vanast; M.D.(Tor.), F.R.C.P.(C)

Associate Members

C. Baker, S. Beaulieu, C. Benkelfat, P. Blier, D. Boivin, P. Boksa, P. Braun, C. Bushnell, D. Chartrand, B. Collier, R. Dykes, G. Debonnel, B. Debruielle, C. de Montigny, J.P.A. Gratton, R. Hess, R. Joobar, S. Kar, F. Kingdom, P. Lachapelle, G. Luheshi, S. Lupien, A. Majnemer, M. Meaney, K. Mullen, D. Payen de la Garanderie, B. Petrof, J. Poirier, R. Quirion, J. Rochford, L. Srivastava, G. Turecki, C.D. Walker, S. Williams, C. Wolfson, K. Worsley, S. Young

Adjunct Professors

Z. Argov, S. Berkovic, F. Cendes, J. Doyon, G. Duncan, A. Gjedde, J. Hardy, C. Holmes, P. Matthews, L. McKerracher, M. Molnar, M. Pandolfo, T. Peters, M. Ptito, Y. Robitaille, N. De Stefano.

54.2 Programs Offered

M.Sc. and Ph.D. in Neurological Sciences.

54.3 Admission Requirements

General

The applicant should be a university graduate and hold a Bachelor's degree in a field related to the subject selected for graduate work.

The applicant must present evidence of high academic achievement. A standing equivalent to a cumulative grade point average of 3.0 out of a possible 4.0 is required by the Graduate and Postdoctoral Studies Office; however, the program prefers applicants to show a higher academic standing, and requires a minimum GPA of 3.3.

Applicants with degrees from a non-Canadian university must submit results of the GRE exam with their application.

Applicants whose undergraduate studies were carried out in a language other than English must submit results of the TOEFL exam with their application and have a score of 600 on the paper-based test (250 on the computer-based test) or higher.

M.Sc. Degree

Bachelor's degree with adequate background in basic sciences, or an M.D.

Ph.D. Degree

M.Sc. in a related field, or an M.D. with post-graduate training or enrolled in M.D.-Ph.D. program

54.4 Application Procedures

Applications will be considered upon receipt of:

1. application form,
2. transcripts,
3. letters of reference,
4. \$60 application fee,
5. TOEFL test results,
6. GRE test results.

All information is to be submitted to above address.

Deadlines:

September entrance – paper and on-line applications (<http://www.mcgill.ca/applying/graduate>) available.

- on-line application deadline: March 1
- paper application deadline: May 1 (February 1 for International candidates)

January entrance –

September 15 (June 1 for International candidates).

To meet the diversity of individual interests and backgrounds, the graduate program for each student is designed at the time of entry. As part of the admission process each applicant will identify, with the participation of the prospective thesis supervisor and the Graduate Studies Committee, a research thesis topic and the course work necessary to complete the training deemed necessary for the degree sought. These decisions become an integral part of the graduation requirements for the student.

54.5 Program Requirements

GENERAL

1. Students must select an Advisory Committee, in conjunction with their thesis supervisor. This committee will consist of the thesis supervisor and two other individuals who will participate in discussions with students about their research program.
2. Students are required to submit a written thesis proposal to the Graduate Studies Committee (at the end of their first year for M.Sc. students, and at least one month prior to the Candidacy Examination for Ph.D. students). This document must state the hypothesis being tested, the relevant literature, and a summary of the methods that will be used to address the research question. This proposal will then be orally presented to the student's Advisory Committee which will also review the written proposal and communicate its recommendations to the student and the Graduate Studies Committee.
3. Students will present a formal seminar on their research work prior to writing their thesis. This presentation will be attended by the student's Advisory Committee and members of the Graduate Studies Committee who will report their impressions and recommendations to the student.
4. An annual oral informal presentation of research work accomplished will be presented to the student's Advisory Committee which in turn presents its report to the Graduate Studies Committee.

M.Sc. DEGREE

Course requirements:

Student with a B.Sc., B.A. or M.D. degree: A minimum of 45 credits distributed as follows:*

- Principles of Neuroscience 1 course: NEUR 630 and either Principles of Neuroscience 2: NEUR 631 or CNS course: NEUR 610;
- 6 credits in other graduate level specialty courses relevant to program;
- 9 credits in Master's project Proposal: NEUR 697 (first term of studies)
- 9 credits in Master's Seminar Presentation: NEUR 698 (second term of studies)

12 credits in Master's Thesis Submission: NEUR 699 (third term of studies)

Upon recommendation, depending upon their particular background and needs, students may be requested to take additional selected courses.

Any remaining credits needed to complete the minimum 45 credits required may be chosen from the following: Master's Thesis Research 1: NEUR 695 (3 credits); Master's Thesis Research 2: NEUR 696 (6 credits).

** Please note that all M.Sc. level students must register for a minimum of 12 credits a term during the first three terms of their Master's program.*

Research requirements:

Presentation of a thesis in a subfield of neuroscience. The thesis must be based upon the research of the student. While not necessarily requiring an exhaustive review of work in a particular field, or a great deal of original scholarship, the thesis must show familiarity with previous work in the field and must demonstrate the ability of the candidate to carry out research and to organize results, all of which must be presented in good literary style. The Graduate Studies Committee expects the student's research should be of sufficient quality for publication in a peer-reviewed journal. A seminar on the thesis topic is given prior to writing the thesis, and each year, a report from the student's Advisory Committee is required by the graduate Studies Committee.

Residence requirements:

Three terms of full-time study.

PH.D. DEGREE

Course requirements:

Students with an M.Sc. degree continuing in this Department have no required courses. It may be recommended that they take specialty courses related to their field of study in neuroscience. Students with an M.Sc. degree from another program will be required to take NEUR 630 and NEUR 631 and/or other courses listed under the M.Sc. degree depending upon their background and field of study.

Students with an M.D. degree proceeding directly into a Ph.D. program will be required to take NEUR 630 and NEUR 631. Recently graduated M.D.s should have the equivalent of NEUR 610, and may be granted equivalence. They will also be required to take 6 credits of graduate level courses.

Doctoral Candidacy Examination (NEUR 700)

All students registering directly into the Ph.D. program on or after September 1998, regardless of prior degrees from McGill or any other academic institutions, must complete the Doctoral Candidacy Examination within 18 months of initial registration in the Program. This is a qualifying examination consisting of a formal presentation and oral examination of the thesis proposal. The questioning will pertain to the student's knowledge and understanding of his/her field of specialization in neuroscience as well as the research proposal. Its primary purpose is to evaluate the student's ability to carry out original scholarship.

The Candidacy Examination will be conducted in conjunction with the Transfer seminar for all students currently registered in the M.Sc. program who apply for transfer to the Ph.D.

Research requirements:

Presentation of a thesis in a subfield of neuroscience. The thesis must display original scholarship expressed in satisfactory literary style and must be a distinct contribution to knowledge. After the thesis has been submitted to, and approved by the Graduate and Postdoctoral Studies Office, a final oral exam will be held on the subject of the thesis and subjects immediately related to it.

Residence requirements:

Three years of resident study of which one year may be completed in the Master's program.

54.6 Graduate Courses

For the term (Fall and/or Winter), days, and times when courses will be offered, please refer to the 2002-2003 Class Schedule on the Web, <http://www.mcgill.ca/minerva-students/class/>. Class locations and names of instructors are also provided.

Students preparing to register are advised to consult the Class Schedule website for the most up-to-date list of courses available. New courses may have been added or courses rescheduled after this Calendar went to press.

The schedule of courses to be offered in Summer 2003, will be available on the website in January 2003.

NEUR has replaced 531 as the prefix for Neurology and Neurosurgery courses.

The course credit weight is given in parentheses after the title.

● Denotes courses not offered in 2002-03

NEUR 602 NEUROSCIENCE SEMINAR 1. (3) (Prerequisite: Permission of Unit Instructor) (Offered alternate years - even numbered years) This course consists of several units, running concurrently, in which small groups of students (up to 8) will participate in discussions of present and past literature that has contributed to the present "state of the art" knowledge on various fields of neuroscience. Each unit will be led by a faculty member with expertise in the chosen area. A list of the literature to be covered will be distributed in the first lecture and updated as new articles appear on the topic. The supervising faculty will introduce the topic. The remainder of the course (12-14 weeks) will be devoted to didactic discussion of the literature and/or students presentations in a journal-club format.

● **NEUR 603 NEUROSCIENCE SEMINAR 2.** (3) (Offered alternate years - even numbered years)

● **NEUR 604 NEUROSCIENCE SEMINAR 3.** (3) (Offered alternate years - odd numbered years) (Prerequisites: NEUR 630, NEUR 631 or NEUR 610; and permission of instructor) (Enrolment limited to 12)

NEUR 605 NEUROSCIENCE SEMINAR 4. (3) (Offered alternate years - odd numbered years) This course focuses on neuronal development and maturation from a molecular aspect. We introduce various model organisms and systems that are used to study molecular aspects of development, explore their particular advantages and explore the cellular and molecular events that contribute to the development of the nervous system.

NEUR 610 CENTRAL NERVOUS SYSTEM. (5) An interdisciplinary course including lectures in neuroanatomy and neurophysiology; laboratories in neuroanatomy, and clinical problems and demonstrations in neurology.

● **NEUR 621 NEUROANATOMY SEMINAR.** (3)

NEUR 630 PRINCIPLES OF NEUROSCIENCE 1. (3) (Prerequisites: BIOL 200 and BIOL 201 or equivalent; permission of instructor) An overview of cellular and molecular neuroscience at the graduate level. Topics include: synthesis, processing and intracellular transport of macromolecules; development of the nervous system including neurogenesis, axonal pathfinding, synaptogenesis and myelination; neuronal survival and response to injury; generation and propagation of action potentials; neurotransmitters and synaptic transmission.

NEUR 631 PRINCIPLES OF NEUROSCIENCE 2. (3) (Prerequisite: Permission of instructor; basic knowledge of mechanisms of neurotransmission and signal transduction.) An overview of the structure, function and interaction of neuronal systems of vertebrates. Topics include basic neuroanatomy, coding and processing of sensory information (somatic sensory, visual and auditory systems), control of posture and voluntary movement, learning and memory, processing of language and speech, cerebral blood flow, the neuroendocrine system and neuroimmunology.

NEUR 695 MASTER'S THESIS RESEARCH 1. (3) Independent work under the direction of the student's supervisor.

NEUR 696 MASTER'S THESIS RESEARCH 2. (6) Independent work under the direction of the student's supervisor.

NEUR 697 MASTER'S PROJECT PROPOSAL. (9) (M.Sc. students only) Presentation of a written thesis proposal by the end of the first year in the program. This document stating the hypothesis being tested, relevant literature and methodology will be orally presented to the student's Advisory Committee which will also review the written proposal and communicate its recommendations to the student and the Graduate Studies Committee.

NEUR 698 MASTER'S SEMINAR PRESENTATION. (9) Student's presentation of a thesis research seminar. In this seminar, the student shall explain the direction of his/her research and present his/her findings to date. The presentation shall take approximately 30 to 45 minutes and shall be followed by a question period. This seminar will be attended by the Graduate Studies Committee, the student's Advisory Committee, and interested observers.

NEUR 699 MASTER'S THESIS SUBMISSION. (12) Submission of a Master's thesis.

NEUR 700 DOCTORAL CANDIDACY EXAMINATION. (0) A qualifying examination consisting of a formal presentation and oral examination of the thesis proposal. The questioning will pertain to the student's knowledge and understanding of his/her field of specialization in neuroscience as well as the research proposal. Its primary purpose is to evaluate the student's ability to carry out original scholarship. (The Candidacy Examination course is also conducted as part of the Transfer seminar for all students currently registered in the M.Sc. program who apply for transfer to the Ph.D.)

COURSES IN OTHER DEPARTMENTS

NOTE: All undergraduate courses administered by the Faculty of Science (courses at the 100- to 500-level) have limited enrolment.

Biology

BIOL 532 DEVELOPMENTAL NEUROBIOLOGY SEMINAR. (3)

BIOL 588 MOLECULAR/CELLULAR NEUROBIOLOGY. (3)

Dentistry

DENT 654 MECHANISMS AND MANAGEMENT OF PAIN. (3)

Physiology

PHGY 520 ION CHANNELS. (3)

PHGY 556 TOPICS IN SYSTEMS NEUROSCIENCE. (3)

Psychiatry

PSYT 500 ADVANCES: NEUROBIOLOGY OF MENTAL DISORDERS. (3)

PSYT 630 STATISTICS FOR NEUROSCIENCES. (3)

Psychology

PSYC 526 ADVANCES IN VISUAL PERCEPTION. (3)

PSYC 710 COMPARATIVE AND PHYSIOLOGICAL PSYCHOLOGY. (3)

55 Nursing

School of Nursing
Wilson Hall
3506 University Street
Montreal, QC H3A 2A7
Canada

Telephone: (514) 398-4151

Fax: (514) 398-8455

Website: <http://www.nursing.mcgill.ca>

Associate Dean of Medicine and Director — S.E. French

Associate Director of Research — C.C. Johnston

55.1 Staff

Emeritus Professor

Elizabeth C. Logan; N., B.Sc.(Acad.), M.Sc.(Yale)

Professors

Susan E. French; N., B.N.(McG.), M.S.(Boston), Ph.D.(Tor.)

Laurie N. Gottlieb; N., B.N., M.Sc.(A.), Ph.D.(McG.)

(Shaw Professor of Nursing)

C. Celeste Johnston; N., M.S.(Boston), B.N., D.Ed.(McG.) *(James McGill Professor)*

Associate Professors

Hélène Ezer; N., B.Sc.(N), M.Sc.(A.)(McG.) *(on leave 2002-03)*

Nancy Frasure-Smith; B.A., Ph.D.(Johns H.) *(part-time)*

Omama Mansi; N., B.Sc.N.(Alexandria), M.Sc.(A.)(McG.)

Carolyn J. Pepler; N., B.N.Sc.(Queen's), M.Sc.N.(Wayne St.), Ph.D.(Mich.) *(part-time)*

Assistant Professors

Marcia Beaulieu; N., B.Sc., M.Sc.(A.), Ph.D.(McG.)

Anita J. Gagnon; N., B.Sc.N., M.P.H., Ph.D.(McG.)

Carmen G. Loiselle; N., B.Sc.(N.)(Montr.), M.S.,

Ph.D.(Wis.-Madison)

Margaret Purden; N., B.Sc.(N), Ph.D.(McG.)

Lecturers

Madeleine M. Buck; N., B.Sc.(N), M.Sc.(A.)(McG.)

Kathryn Carnaghan-Sherrard; N., B.N., M.Sc.(A.)(McG.)

Cindy Dalton; N., B.Sc.(N.), M.Sc.(A.)(McG.)

Anne Gilchrist; N., B.Sc., M.Sc.(A.)(McG.)

Catherine P. Gros; N., B.Sc.(Mass.), M.Sc.(A.)(McG.) *(part-time)*

55.2 Programs Offered

Master's Programs

Two types of Master's degrees are offered: Master of Science (Applied) and Master of Science (with thesis) (not offered 2002-03). These programs are designed to prepare clinicians and researchers for the expanding function of nursing within the health care delivery system.

Master of Science (Applied)

The objective of this program is to prepare specialists in nursing able to participate in the development, implementation and management of services in all domains of health care. Opportunity is provided for the advanced clinical study of nursing, and for incorporating research and evaluation methods in the investigation of nursing problems.

Master of Science (with thesis) (not offered 2002-03).

Doctoral Studies in Nursing

The School of Nursing of McGill University and the Faculté des Sciences Infirmières of the Université de Montréal offer a joint doctorate program leading to a Ph.D. in Nursing. This program is offered in English at McGill.

The program is designed to train researchers who will make a contribution to the advancement of knowledge in the field of nursing and assume a leadership role both in the profession and in the health care system.

55.3 Admission Requirements

Master's Programs

Non-Canadian applicants shall normally be required to submit documented proof of competency in oral and written English, e.g. TOEFL (600 minimum on the paper-based test, 250 minimum on the computer-based test) or equivalent.

GRE – may be required in individual circumstances.

Nurse applicants

Applicants for the Master's degree must have completed a bachelor's degree in nursing with a minimum GPA of 3.0 on a scale of 4.0. This preparation must be comparable to that offered in the bachelor's program at McGill. Experience in nursing is suggested. An introductory statistics course (3 credits) is strongly recommended.

Nurses with a general B.Sc. or B.A. (comparable to the McGill undergraduate degrees) may be considered on an individual basis.

All nurse applicants are expected to hold current registration in the province or country from which they come. Nurses who are not

licensed in Quebec must obtain a special authorization for graduate nurse students from the Order of Nurses of Quebec.

Non-nurse applicants (direct entry Master's students)

Applicants holding a B.Sc. or B.A., which includes a number of pre-requisite courses, may be admitted to a Qualifying Year. Upon successful completion of their studies, candidates may apply directly to the Master's program. (Persons prepared in another professional discipline or in nursing are not eligible for this program.) A GPA of 3.0 or above on a scale of 4.0 is required for entry.

Ph.D. Program

Applicants admitted to the Doctoral program through McGill University must satisfy the following conditions:

1. hold a Master of Science in Nursing or equivalent;
2. GPA of 3.3 or high B standing;
3. demonstrated research ability;
4. be accepted by a faculty member who has agreed to serve as the thesis adviser;
5. submit a 5-page outline of proposed research including literature review and abbreviated methods sections;
6. submit letters of references from two professors who are familiar with the candidate's work and research aptitude;
7. submit a curriculum vitae;
8. submit two official copies of academic transcripts of undergraduate and graduate records,
9. be eligible to hold nursing registration in Quebec;
10. submit results of the Graduate Record Examination General Test.

55.4 Application Procedures

Application for admission to any of these programs is made on application forms available from the Graduate Program Office in the School of Nursing. Applications must be completed according to the instructions that accompany the forms.

Deadline for receipt of application for September admission is March 30. All documents required for admission should be submitted by this deadline.

Commencing with applications for entry in January 2003, McGill's on-line application form will be available to all graduate program candidates at <http://www.mcgill.ca/applying/graduate>.

55.5 Program Requirements

Master's Programs

The general rules concerning higher degrees apply. (See the Graduate and Postdoctoral Studies Office General Information and Regulations.) A minimum of two years of study is required for the Masters programs.

Nurse applicants to the Master's program may complete their studies on a part-time basis, i.e. minimum of 6 credits per term to a maximum of four years.

Non-nurse applicants must complete their qualifying year and the Master's program of study on a full-time basis.

M.SC. (THESIS) (50 credits) (not offered 2002-03)

M.SC. (APPLIED)

(48 credits nurse students; 52 credits non-nurse students)

First Year

(24 credits nurse students; 28 credits non-nurse students)

Fall Term

- NUR2 611D1 (3) Seminar in Nursing 1
 NUR2 612 (3) Research Methods in Nursing 1
 NUR2 614D1 (3) Clinical Laboratory in Nursing 1
 NUR2 623 (3) Clinical Assessment and Therapeutics (Generic students only)

Winter Term

- NUR2 611D2 (3) Seminar in Nursing I
 NUR2 614D2 (3) Clinical Laboratory in Nursing 1
 NUR2 627 (3) Nursing Practicum

Fall or Winter Term

one 3-credit Statistics course

Complementary course chosen in consultation with the advisor. (3 credits) (Nurse students only)

Summer Term

- NUR2 616 (4) Advanced Clinical Skills (Generic students only)

Second Year (24 credits)

Fall Term

- NUR2 620 (2) Current Theories of Nursing
 NUR2 621D1 (3) Seminar in Nursing 2
 NUR2 624 (4) Clinical Laboratory in Nursing 2
 NUR2 626 (3) Developments in Nursing Education and Administration

Winter Term

- NUR2 615 (3) Health Care Evaluation
 NUR2 621D2 (3) Seminar in Nursing 2
 NUR2 625 (6) Clinical Laboratory in Nursing 3

QUALIFYING YEAR

(non-nurse applicants entering with B.A. or B.Sc.)

Fall Term

- NUR1 222 (1) McGill Model of Nursing
 NUR2 511D1 (3) Practice of Nursing – Part 1
 NUR2 514D1 (5) Clinical Laboratory in Nursing

Winter Term

- NUR1 235 (4) Health and Physical Assessment
 NUR2 511D2 (3) Practice of Nursing – Part 1
 NUR2 514D2 (5) Clinical Laboratory in Nursing

Summer Term

- NUR2 512 (8) Practice of Nursing – Part 2

Complementary Courses (12 credits)

12 credits from the physical sciences, social sciences and nursing, are chosen in consultation with faculty to complement the student's previous academic background.

Students must successfully complete the Qualifying Year and be recommended by the Standing and Promotions Committee for entry to the Master of Science (Applied) Program.

Ph.D. PROGRAM

Each student's program is designed with the research director and thesis supervisor, taking into account the student's previous academic preparation, needs and research interests. The requirements for the doctoral degree are:

1. A minimum of 18 credits beyond the Master's level. Courses and seminars in research design, issues of measurement, advanced nursing, development of theory in nursing, advanced statistics and complementary course(s) in the student's major field of study are compulsory. The student's program is decided in consultation with the faculty advisor.
2. Successful completion of the Ph.D. comprehensive examination.
3. Oral defense of the thesis proposal.
4. Dissertation and oral examination.
5. Two years of full-time residence. A student who has obtained a Master's degree at McGill University or at an approved institution elsewhere, and is proceeding in the same subject to a Ph.D. degree, may on the recommendation of the School, be registered in the second year of the Ph.D. program.

55.6 Courses

For the term (Fall and/or Winter), days, and times when courses will be offered, please refer to the 2002-2003 Class Schedule on the Web, <http://www.mcgill.ca/minerva-students/class/>. Class locations and names of instructors are also provided.

Students preparing to register are advised to consult the Class Schedule website for the most up-to-date list of

courses available. New courses may have been added or courses rescheduled after this Calendar went to press.

The schedule of courses to be offered in Summer 2003, will be available on the website in January 2003.

Details of the courses to be offered in the current year are also available from the School.

Courses with numbers ending D1 and D2 are taught in two consecutive terms (most commonly Fall and Winter). Students must register for both the D1 and D2 components. No credit will be given unless both components (D1 and D2) are successfully completed in consecutive terms.

Note the following Nursing course prefix changes:

NUR1 has replaced 572, NUR2 has replaced 573, NUR3 has replaced 575.

The course credit weight is given in parentheses after the title.

- Denotes courses not offered in 2002-03

QUALIFYING PROGRAM

NUR1 222 MCGILL MODEL OF NURSING. (1) This introductory course provides an overview of the history and the philosophical and theoretical tenets underlying the core concepts of the Model. Students are introduced to McGill's perspective on health, family, learning, and collaborative nursing through a study of selected theoretical and research papers.

NUR1 235 HEALTH AND PHYSICAL ASSESSMENT. (4) This course will develop basic knowledge and skills required to do a health history and to carry out basic physical assessment in infants, children, and adults.

NUR2 511D1 PRACTICE OF NURSING PART 1. (3) A study of selected concepts related to the practice of nursing including health, family, normative life transitions and interpersonal interaction. The major focus is on developing an understanding of human behaviour using the process of scientific inquiry. Special emphasis is placed on the observation of people in their physical and social environments and on the analysis of clinical data as the basis for the development of innovative nursing approaches.

NUR2 511D2 PRACTICE OF NURSING PART 1. (3)

NUR2 512 PRACTICE AND THEORY IN NURSING. (8) Learning to nurse patients in acute care settings, who are experiencing a variety of common illness-related problems.

NUR2 514D1 CLINICAL LABORATORY IN NURSING. (5) Learning to nurse through field experiences with individuals and families in the community and in acute care settings. The focus is on the application of knowledge and theory in practice and includes the testing and analysis of nursing approaches. Students work with clients and families experiencing a variety of life events including aging, birth and parenting as well as acute illness and hospitalization.

NUR2 514D2 CLINICAL LABORATORY IN NURSING. (5)

GRADUATE PROGRAM

NUR2 611D1 SEMINAR IN NURSING. (3) A critical study of selected concepts in nursing and health related to individuals and families. An introduction to the study of concepts and theories relevant to nursing.

NUR2 611D2 SEMINAR IN NURSING. (3)

NUR2 612 RESEARCH METHODS IN NURSING 1. (3) Basic knowledge and skills needed to conduct research. The philosophy and principles of scientific inquiry, research design, sampling, techniques of data collection, ethics, and incorporating research into practice are discussed with emphasis for nursing.

NUR2 614D1 CLINICAL LABORATORY - NURSING 1. (3) Field experience in nursing to test and develop concepts critical to the health of individuals and families. The examination of theories relevant to nursing practice in the clinical field.

NUR2 614D2 CLINICAL LABORATORY - NURSING 1. (3)

NUR2 615 HEALTH CARE EVALUATION. (3) An evaluation of educational and health care systems with particular reference to the nursing input in problems of health, health care and health care

delivery. Evaluative research includes qualitative and quantitative approaches to assessing health status and quality of care.

NUR2 616 ADVANCED CLINICAL SKILLS. (4) Supervised clinical experiences in health care agencies are aimed at developing competence in technical and family nursing skills at an advanced level. Experience is determined on an individual basis according to learning needs and the student's area of interest.

NUR2 620 CURRENT THEORIES OF NURSING. (2) (Prerequisites: NUR2 611, NUR2 614 or equivalent) Current theories of nursing e.g. Orem, Roy, King, Rogers are examined along with their implications for practice, curriculum, administration, and research. The internal and external adequacy of these theories will be evaluated using selected schema. Critical analysis of issues and problems of theories in a practice discipline will be undertaken.

NUR2 621D1 SEMINAR IN NURSING 2. (3) An opportunity for investigation of some of the critical problems in nursing as related to the student's area of inquiry. Particular emphasis is placed on theory development in nursing.

NUR2 621D2 SEMINAR IN NURSING 2. (3)

NUR2 623 CLINICAL ASSESSMENT AND THERAPEUTICS. (3) (Prerequisites: PATH 300; PHGY 201, PHGY 202 or equivalent.) Development of skills in the medical-nursing assessment and management of patients and families dealing with chronic and life-threatening illnesses. Includes instruction in history-taking and physical assessment.

NUR2 624 CLINICAL LABORATORY IN NURSING 2. (4) Field experience in nursing, incorporating extensive assessment, experimentation and evaluation of differing nursing approaches.

NUR2 625 CLINICAL LABORATORY IN NURSING 3. (6) Field experience in nursing, incorporating extensive assessment, experimentation and evaluation of differing nursing approaches.

NUR2 626 CURRENT DEVELOPMENTS IN NURSING EDUCATION & ADMINISTRATION. (3) An examination of theories of learning and organizational behaviour as related to the preparation of nurses for the delivery of health care services. Implications of these theories for the assessment, development, and evaluation of nursing programs will be investigated.

NUR2 627 NURSING PRACTICUM. (3) Research, administrative or teaching projects in nursing are defined by interested faculty and developed with students. The goal is to promote and enhance scholarly activity and productivity. At completion, there should be some final product such as a manuscript, a data collection system set-up, or the synthesis of pilot data.

● **NUR2 690 M.Sc. THESIS 1.** (4)

● **NUR2 691 M.Sc. THESIS 2.** (8)

● **NUR2 692 M.Sc. THESIS 3.** (12)

Ph.D. PROGRAM

NUR2 701 COMPREHENSIVE EXAMINATION. (1)

The following courses (NUR2 702, NUR2 703, NUR2 730, NUR2 780) may be offered on-site in the Atlantic Provinces. In addition to regular fees, a distance delivery charge of \$500 per course would apply. Please contact the School for further information.

NUR2 702 RESEARCH DESIGN. (3) The logic and procedures of both qualitative and quantitative research designs are examined with particular emphasis on their appropriateness for addressing nursing and health problems. Issues specific to the design of nursing and health care studies are explored. Included in the types of designs analyzed are: experimental and quasi-experimental, ethnographic, grounded theory and evaluative.

NUR2 703 ISSUES OF MEASUREMENT. (3) An examination of the underlying theories of measurement and techniques for assessing the validity and reliability of data collection instruments. Issues related to the development and/or utilization of instruments to measure target variables in nursing and health research are addressed.

NUR2 730 THEORY DEVELOPMENT IN NURSING. (3) (Prerequisite: NUR2 620 or equivalent) This course surveys the history of nursing theory development with special emphasis placed on the approaches theory development and the factors affecting these approaches. Issues such as the level of theory, where theory derives are examined in light of the needs of a practice discipline. Future directions for theory development in nursing are explored.

NUR2 780 ADVANCED NURSING. (3) (3 hours seminar weekly) (Prerequisite: NUR2 621, NUR2 624, NUR2 625 or equivalent and permission of instructor) An in-depth analysis of selected issues and developments within nursing and health care. Included will be topics relevant to the areas of research and clinical expertise of the student and faculty.

56 Occupational Health

Department of Occupational Health
Purvis Hall
1020 Pine Avenue West
Montreal, QC H3A 1A2
Canada

Website: <http://www.mcgill.ca/occh>

Chair — R. Fuhrer

M.Sc. (Resident) and Ph.D. programs:

Telephone: (514) 398-4229

Fax: (514) 398-4503

Email: graduate.occh@mcgill.ca

Coordinator (M.Sc. Resident/Ph.D.) — S. Larivière

M.Sc. (Distance Education) program:

Telephone: (514) 398-6989

Fax: (514) 398-7153

Email: dist.occh@mcgill.ca

Website: <http://www.mcgill.ca/occh/programs/distance>

Coordinator (M.Sc. Distance Education) — K. Murphy

56.1 Staff

Emeritus Professor

J.C. McDonald; M.D., B.S.(Lond.), M.Sc.(Harv.), F.R.C.P.(C)

Professors

J.P. Farant; Ph.D.(Carl.), C.I.H.

C. Infante-Rivard; M.D.(Montr.), M.P.H.(UCLA), Ph.D.(McG.),

F.R.C.P.(C) (*James McGill Professor*)

G. Thériault; M.D.(Laval), M.I.H., Dr. P.H.(Harv.)

Assistant Professors

S. Martin; B.A., M.D.(Tor.), M.Sc.A.(McG.)

L. Patry, B.Sc., M.D.(Laval), F.R.C.P.(C)

Associate Professors

A. Dufresne; B.Sc., M.Sc.(Que.), Ph.D.(McG.)

P. Héroux; B.Sc.(Laval), M.Sc., Ph.D.(I.N.R.S.)

T. Kosatsky; M.D.(Man.), M.P.H.(Emory)

M. Rossignol; B.Sc., M.D.(Sher.), M.Sc.(McG.), F.R.C.P.(C)

Lecturers

G. Desbiens, P. Dubé, J.P. Gauvin

Associate Members

M.R. Becklake, J.F. Boivin, P. Ernst, F. Liddell, A.D. McDonald

(*Epidemiology and Biostatistics*)

B. Case (*RVH-Pathology*)

Adjunct Professors

D. Amre (Hôpital Ste-Justine); I. Arnold (Alcan); S. Arnold (McGill);

P. Auger (Montreal Chest Hospital); M. Baillargeon (Montreal

Chest Hospital); L. DeGuire, L. Drouin, M. Goldberg, P. Robillard,

S. Stock (Direction de la santé publique); A. Dembe (U. of

Massachusetts); D. Gautrin (Hôpital Sacré-Coeur); C. Martin (U. of

West Virginia); B. Pant (Concordia); G. Perrault (IRSST);

J. Siemiatycki (Institut Armand Frappier); C. Tremblay (Santé

Publique-Montérégie); W. Wood (Environmental Safety Office, McGill).

56.2 Programs Offered

The Department of Occupational Health offers two graduate degree programs: a doctorate (Ph.D.) and Master (M.Sc.A) in occupational health sciences. The Master's program is available on campus or in distance education format.

M.Sc. Applied Program (Full-time) (Resident) (on campus)

The objective of this program is to train and enable competent health and hygiene professionals to work in occupational health programs by evaluating the work environment and work hazards and by proposing appropriate methods of prevention and control.

M.Sc. Applied Program (Distance Education)

A three and one-half year program leading to the degree of Master of Science Applied in Occupational Health Sciences – M.Sc.(A). This program is also offered for professional interest, for details please contact the Coordinator.

Ph.D. Program

The objective of this program is to train independent researchers in the field of work environment and health.

56.3 Admission Requirements

Non-Canadian applicants whose mother tongue is not English and who have not completed an undergraduate degree using the English language are required to submit documented proof of competency in oral and written English, by appropriate exams e.g. TOEFL (Test of English as a Foreign Language) with a minimum score of 600, or 250 on the computerized test.

M.Sc. Applied Program (Full-time) (Resident) (on campus)

Candidates should have completed, with high academic standing, a bachelor of science degree or its equivalent in a discipline relevant to occupational health or hygiene such as: chemistry, engineering, environmental sciences, physics; medicine, nursing and other health sciences with a standing equivalent to a minimum Cumulative Grade Point Average (CGPA) of 3.0 out of 4. High grades are expected in courses considered by the Department to be preparatory to the graduate program.

M.Sc. Applied Program (Distance Education)

Candidates must hold an M.D., a bachelor's degree in nursing, or a B.Sc. (any major). They must have maintained at least a 3.0 on 4.0 grade point average.

Those who hold a B.Sc. must be Industrial Hygienists with at least three years of experience in industrial hygiene and/or safety. In the case of medical doctors and nurses, priority will be given to candidates with two or more years of experience in occupational health.

Ph.D. Program

Candidates must hold a M.Sc. degree or its equivalent in occupational health sciences, or in a relevant discipline, such as: community health, environmental health, epidemiology, chemistry, engineering, physics, or health sciences (medicine, nursing, etc.).

56.4 Application Procedures

Application forms are now available on-line at the following website: <http://www.mcgill.ca/applying/graduate>.

M.Sc. Applied Program (Full-time) (Resident) (on campus)

Candidates must submit with their application two official copies of their university transcripts, two letters of reference, a copy of their curriculum vitae and a letter describing their background (occupational health, occupational hygiene, worker safety, etc.) as well as a \$60(Cdn) application fee.

Eligible candidates may be invited for an interview with members of the Admissions Committee of the Department.

Applications are accepted for fall term only.

M.Sc. Applied Program (Distance Education)

Candidates must submit with their application two official transcripts from their university of graduation, two letters of recommendation, a copy of their résumé, a letter describing their career

plan, the reasons for their enrolment, and how they plan to accommodate their study time within their work schedule as well as a \$60(Cdn) application fee.

Ph.D. Program

Candidates must submit with their application two official copies of their university transcripts (undergraduate and graduate), two letters of reference (or completed special forms), a copy of their curriculum vitae and a letter describing their field of interest as well as a \$60(Cdn) application fee.

Candidates must also submit with their application an outline of their scientific interests, indicating the field and the topic of their proposed research. Each student will be assigned to one academic staff member of the Department, who will act as his/her supervisor, who will guide him/her in the preparation of a definite research protocol.

56.5 Program Requirements

It is highly recommended to have access to a computer and the internet as some of the course material is most readily available by accessing the web.

M.SC. APPLIED PROGRAM (FULL-TIME) (RESIDENT) (ON CAMPUS)

Teaching is organized in eight 3-credit courses and one 6-credit course totalling 30 credits. Promotion to the following semester is dependent upon passing grade. A comprehensive examination is held at the end of the course program.

After successfully completing the course requirements and passing the comprehensive examination, students must carry out an extended project (15 credits). The project requires students to identify an issue in their area of specialization, to review the present state of knowledge relevant to that issue, and either to carry out a survey to assess a particular work situation and make recommendations, or to devise a research protocol to extend knowledge in the area and to carry out a preliminary study to assess the feasibility of the protocol proposed.

Normally, students extend the duration of their project into the Fall term by registering for an additional session.

Required Courses (30 credits)

OCCH 602	(3)	Occupational Health Practice
OCCH 603	(3)	Work and Environment Epidemiology 1
OCCH 604	(3)	Monitoring Occupational Environment
OCCH 605D1	(3)	Physical Health Hazards
OCCH 605D2	(3)	Physical Health Hazards
OCCH 608	(3)	Biological and Chemical Hazards
OCCH 612	(3)	Principles of Toxicology
OCCH 614	(3)	Topics in Occupational Health
OCCH 615	(3)	Occupational Safety Practice
OCCH 616	(3)	Occupational Hygiene
OCCH 600		M.Sc.(A) Comprehensive Examination

Project Component – Required (15 credits)

OCCH 699	(15)	Project Occup. Health & Safety
----------	------	--------------------------------

M.SC. APPLIED PROGRAM (DISTANCE EDUCATION)

The Master distance education program takes three and one-half years to complete.

The first part (3 years) consists of 10 three-credit theory courses. Students enrolled in the program must successfully complete ten courses (30 credits). Equivalencies may be granted upon examination of the application by the professors concerned, and the Graduate and Postdoctoral Studies Office.

On-campus Practicums may be held at the discretion of each professor. These sessions are held in Montreal on the McGill University Campus. Their aim is to offer students additional specific learning activities. Each course has a final examination at the end of the term. Participation in the practica is an essential component of the program.

The second part consists of writing an extended project report (15 credits). The project report will be carried out under the supervision of a member of the teaching staff. Note that students must

pass the comprehensive exam before writing their report. A total of 45 credits is offered, the number required to complete the M.Sc. program.

Courses

OCCH 602	(3)	Occupational Health Practice
OCCH 603	(3)	Work & Environment Epidemiology 1
OCCH 604	(3)	Monitoring Occupational Environment
OCCH 608	(3)	Biological and Chemical Hazards
OCCH 612	(3)	Principles of Toxicology
OCCH 615	(3)	Occupational Safety Practice
OCCH 616	(3)	Occupational Hygiene
OCCH 617	(3)	Occupational Diseases
OCCH 624	(3)	Social & Behavioural Aspects of Occupational Health
OCCH 625	(3)	Work & Environment Epidemiology 2
OCCH 626	(3)	Basics of Physical Health Hazards
OCCH 627	(3)	Work Physiology and Ergonomics
OCCH 630	(3)	Occupational Disease for OHNs
OCCH 635	(3)	Environmental Risks to Health
OCCH 600		M.Sc.(A) Comprehensive Examination

Each course has a final examination at the end of the term. Students must obtain at least 65% (B-) in each course in the program. Students who fail one course will be invited to withdraw from the program. Special circumstances can be examined.

Project Component – Required (15 credits)

OCCH 699	(15)	Project Occup. Health & Safety
----------	------	--------------------------------

PH.D. PROGRAM

Three years of resident study are required for this program.

Students are required to take course OCCH 706 Occupational Health and Hygiene Seminars (2 credits) and are encouraged to take up to 12 credits in areas pertinent to their specialty or in areas necessary to complete their knowledge of occupational health.

All Ph.D. students must take a comprehensive examination within 18 months of registration.

A thesis committee will be established to ensure proper supervision and coverage of the different fields of expertise as required.

56.6 Courses

For the term (Fall and/or Winter), days, and times when courses will be offered, please refer to the 2002-2003 Class Schedule on the Web, <http://www.mcgill.ca/minerva-students/class/>. Class locations and names of instructors are also provided.

Students preparing to register are advised to consult the Class Schedule website for the most up-to-date list of courses available. New courses may have been added or courses rescheduled after this Calendar went to press.

The schedule of courses to be offered in Summer 2003, will be available on the website in January 2003.

OCCH has replaced 392 as the prefix for Occupational Health courses.

The course credit weight is given in parentheses after the title.

- Denotes courses not offered in 2002-03
- Denotes limited enrolment

OCCH 600 COMPREHENSIVE EXAMINATION. (0)

May also be added as: OCCH 600D1, OCCH 600D2.

OCCH 605D1 PHYSICAL HEALTH HAZARDS. (3) (Students must also register for OCCH 605D2) (No credit will be given for this course unless both OCCH 605D1 and OCCH 605D2 are successfully completed in consecutive terms) Properties, mechanisms of action and health effects of physical agents in the workplace and in the general environment: electromagnetic risks, noise and vibration, ionizing radiation, ventilation and thermal environment. Administrative, engineering and medical control methods, exposure standards and safety measures for these agents.

OCCH 605D2 PHYSICAL HEALTH HAZARDS. (3) (Prerequisite: OCCH 605D1) (No credit will be given for this course unless both

OCCH 605D1 and OCCH 605D2 are successfully completed in consecutive terms) See OCCH 605D1 for course description.

□ **OCCH 602 OCCUPATIONAL HEALTH PRACTICE.** (3) This course analyzes the functions, structure and organization of occupational health programs and services.

□ **OCCH 603 WORK AND ENVIRONMENT EPIDEMIOLOGY 1.** (3) This course provides students with basic knowledge of epidemiology and statistics as applied to occupational health.

OCCH 604 MONITORING OCCUPATIONAL ENVIRONMENT. (3) Principles and practices of environmental and biological monitoring of workplace hazards are addressed. Familiarization with instrumentation and calibration procedures is undertaken. Students learn to identify workplace health hazards, develop effective sampling strategies, use industrial hygiene equipment and interpret results of exposure measurements.

□ **OCCH 608 BIOLOGICAL AND CHEMICAL HAZARDS.** (3) This course will acquaint the student with the physical, chemical, and toxicological properties of common industrial products, important industrial processes and their associate health and safety hazards and the control measures.

□ **OCCH 612 PRINCIPLES OF TOXICOLOGY.** (3) Selected topics, including acute, subacute and chronic toxicity assessment, pharmacokinetics and pharmacodynamics, mutagenicity, carcinogenicity and teratogenicity.

OCCH 614 TOPICS IN OCCUPATIONAL HEALTH. (3) Using a problem oriented approach, this course aims at integrating all notions seen previously in the program. Advanced learning, lectures, readings, student presentations, written assignments.

□ **OCCH 615 OCCUPATIONAL SAFETY PRACTICE.** (3) Principles of safety and loss prevention; incident investigations and analyses, occupational safety management tools; loss recognition; safety standards, guidelines and legislation. Selected topics include: fire prevention; workshop, tool and machine safety; fall protection; laboratory safety; confined space entry; safe work permit systems; and materials handling.

□ **OCCH 616 OCCUPATIONAL HYGIENE.** (3) An introduction to the principles and practices of industrial hygiene designed to provide the students with the knowledge required to identify health and safety hazards in the workplace.

OCCH 617 OCCUPATIONAL DISEASES. (3) Review of occupational health problems structured around target organs: respiratory, musculo-skeletal, skin, cardiovascular, mental disorders and aggressive agents: trauma, physical agents, solvents and metals and infectious agents. Also covered are occupational cancer, conditions associated with hypo-and hyperbaric environments, mutagenicity, teratogenicity and reproduction disorders, pre-employment, period examination and medical activities in the workplace.

OCCH 620 FIELD WORK. (3)

OCCH 624 SOCIAL AND BEHAVIOURAL ASPECTS - OCCUPATIONAL HEALTH. (3) This course explores the social science of occupational health practice, and describes influences on that practice of recent political, social and economic changes in the workforce and at the workplace; the theory of health promotion; management skills; and evaluation methods.

OCCH 625 WORK AND ENVIRONMENT EPIDEMIOLOGY 2. (3) Combined with OCCH 608 to prepare students to evaluate the relations between exposure to workplace contaminants and health. The course involves the multidisciplinary analysis of four problems: Work-related cancer; Musculo-skeletal problems; Biological hazards; Chemical intoxication.

OCCH 626 BASICS: PHYSICAL HEALTH HAZARDS. (3) Properties, mechanisms of action and health effects of physical agents in the workplace: thermal environment, noise and vibration, electromagnetism and ionizing radiation. Engineering control methods, exposure standards and safety measures for physical agents. Basics of monitoring workers for health impacts. Control of airborne contaminants using ventilation-based dilution methods.

OCCH 627 WORK PHYSIOLOGY AND ERGONOMICS. (3) Provide students with basic knowledge of physiological and psychological work requirements, ergonomic approach to work-related health problems and application of this type of approach to preventive and corrective measures.

OCCH 630 OCCUPATIONAL DISEASES FOR OHNS. (3) Designed to meet independent and specific needs of occupational health nurses, it examines potential pathologies in the workplace, and subsequent disease outcomes. Focus is on an evidence-based approach to assessment, nursing diagnosis, appropriate interventions in the identification, management of occupational diseases. Worker screening strategies and disease prevention activities are introduced.

OCCH 635 ENVIRONMENTAL RISKS TO HEALTH. (3) Focuses on pathways of exposure from industry to non working populations, on measurement of exposure and observation of effects, modeling and prediction of effects. Identifying, assessing and adapting existing data to predict effects given new exposures is a major theme. Spatial analysis, risk communication and disaster response are covered, too.

OCCH 699 PROJECT OCCUPATIONAL HEALTH AND SAFETY. (15) Under supervision, the student will identify an issue relevant to occupational health and report on work accomplished (i) to review the present state of knowledge and (ii) to conduct a survey and make recommendations or to devise a study proposal and to carry out a preliminary feasibility study.

May also be added as: OCCH 699D1, OCCH 699D2.

M.SC.(A) APPLIED PROGRAM (RESIDENT) COURSES

Students with a strong interest in ergonomics could take course OCCH 627 Work Physiology and Ergonomics given in the Distance Education program as an additional course. This is not a required course for the resident program students and will not exempt students from taking all the required courses in the resident program.

Those with a strong interest in risk assessment are invited to take the summer course EPIB 668 Special Topics 1. This is not a required course and will not exempt the resident program or distance education program students from taking all the required courses in their respective programs. For more information on this course, please contact the Summer Program Office at tel: (514) 398-3973 or email: summer@epid.lan.mcgill.ca or refer to their website: <http://www.epi.mcgill.ca>.

M.SC.(A) DISTANCE EDUCATION PROGRAM COURSES

PH.D. COURSES

OCCH 700 COMPREHENSIVE EXAMINATION. (0)

May also be added as: OCCH 700D1, OCCH 700D2.

OCCH 706D1 PH.D SEMINAR ON OCCUPATIONAL HEALTH AND HYGIENE. (1) (Students must also register for OCCH 706D2) (No credit will be given for this course unless both OCCH 706D1 and OCCH 706D2 are successfully completed in consecutive terms) (OCCH 706D1 and OCCH 706D2 together are equivalent to OCCH 706) A critical appraisal of the occupational health sciences literature which addresses issues in hygiene, safety, epidemiology and toxicology. Students will develop a critical sense of the literature and increase their understanding of different research paradigms.

OCCH 706D2 PH.D SEMINAR ON OCCUPATIONAL HEALTH AND HYGIENE. (1) (Prerequisite: OCCH 706D1) (No credit will be given for this course unless both OCCH 706D1 and OCCH 706D2 are successfully completed in consecutive terms)

57 Otolaryngology

Department of Otolaryngology
Montreal Children's Hospital
2300 Tupper Street
Montreal, QC H3H 1P3
Canada

Telephone: (514) 934-4344
Fax: (514) 934-4342
Website: <http://www.mcgill.ca/ent>

Chair — M.D. Schloss

57.1 Staff

Emeritus Professor

J.D. Baxter; M.D., C.M., M.Sc.(McG.), F.R.C.S.(C)

Professors

S. Frenkiel; B.Sc., M.D., C.M.(McG.), F.R.C.S.(C)
A. Katsarkas; M.D.(Thess.), M.Sc.(Otol.), F.R.C.S.(C)
M.D. Schloss; M.D.(Br.Col.), F.R.C.S.(C)
T.L. Tewfik; M.D.(Alex.), F.R.C.S.(C)

Associate Professors

M.J. Black; M.D., C.M.(McG.), F.R.C.S.(C)
N. Fanous; M.B., BCh.(Cairo), F.R.C.S.(C)
W.R.J. Funnell; B.Eng., M.Eng., Ph.D.(McG.)
J. Manoukian; M.B., Ch.B.(Alex.), F.R.C.S.(C)
M. Mendelsohn; B.Sc., M.D., C.M.(McG.), F.R.C.S.(C)
W.H. Novick; M.D.(Queen's), F.R.C.S.(C)
B. Segal; B.Sc., B.Eng., M.Eng., Ph.D.(McG.)
R.S. Shapiro; M.D., C.M.(McG.), F.R.C.S.(C)

Assistant Professors

F. Chagnon; M.D.C.M.(McG.), F.R.C.S.(C)
I. Fried; M.D.(Dal.), F.R.C.S.(C)
M. Hier; M.D., C.M.(McG.), F.R.C.S.(C)
K. Kost; M.D., C.M.(McG.), F.R.C.S.(C)
R. Lafleur; M.D.(Ott.), F.R.C.S.(C)
M.-L. Lessard; M.D.(Laval), F.R.C.S.(C)
J. Rappaport; M.D.(Dal.), F.R.C.S.(C)
L. Rochon; M.D.(Sher.), F.R.C.P.(C)
M. Samaha; M.D.(Queen's), F.R.C.S.(C)
G. Sejean; M.D.(Beirut), F.R.C.S.(C)
R. Sweet; M.D., C.M.(McG.)
L. Tarantino; M.D.(Naples), F.R.C.S.(C)
A.G. Zeitouni; M.D.(Sher.), M.Sc.(Otol.), F.R.C.S.(C)

Lecturers

A. Finesilver; M.D., C.M.(McG.), F.R.C.S.(C)
J. Rothstein; M.D., C.M.(McG.), F.R.C.S.(C)

Adjunct Professors

M. Desrosiers; M.D.(Montr.), F.R.C.S.(C)
J.-J. Dufour; M.D.(Laval), F.R.C.S.(C)

57.2 Program Offered

The Master of Science degree in Otolaryngology trains otolaryngologists for clinical or basic-science research in Otolaryngology.

57.3 Admission Requirements

Admission to the M.Sc. program requires acceptance by a research supervisor, and the proposed program must be approved by the Departmental Research Committee.

All applicants must be otolaryngologists or they should be currently enrolled in a residency program leading to certification in Otolaryngology.

57.4 Application Procedures

Applications require the following documentation:

1. completed application form and personal statement form;
2. letters of reference from two professors;

3. two official copies of academic transcripts;
4. application fee: \$60;
5. results of Test of English as a Foreign Language (TOEFL) (minimum of 550 on the paper-based test or 213 on the computer-based test) if undergraduate and medical training were carried out in a language other than English or French.

Prospective students should contact research supervisors individually.

Commencing with applications for entry in January 2003, McGill's on-line application form will be available to all graduate program candidates at <http://www.mcgill.ca/applying/graduate>.

57.5 Program Requirements

The M.Sc. program comprises a minimum of 45 credits as follows:

Required Courses (12 credits)

OTOL 602	(3)	Physiology, Histopathology and Clinical Otolaryngology 1
OTOL 612	(3)	Physiology, Histopathology and Clinical Otolaryngology 2
OTOL 603	(3)	Advanced Scientific Principles of Otolaryngology 1
OTOL 613	(3)	Advanced Scientific Principles of Otolaryngology 2

Complementary Course (3 credits)

EPIB 607	(3)	Principles of Inferential Statistics in Medicine or equivalent
----------	-----	--

Thesis Component – Required (30 credits)

OTOL 690	(3)	Thesis 1
OTOL 691	(3)	Thesis 2
OTOL 692	(6)	Thesis 3
OTOL 693	(6)	Thesis 4
OTOL 694	(12)	Thesis 5

When appropriate, courses OTOL 602, OTOL 612, OTOL 603 or OTOL 613 may be replaced by other basic-science or clinical (500-level or higher) courses of relevance to Otolaryngology, as recommended or approved by the Department.

Students aiming to acquire an interdisciplinary background will be expected to take additional elective courses, at the undergraduate level if necessary.

57.6 Graduate Courses

For the term (Fall and/or Winter), days, and times when courses will be offered, please refer to the 2002-2003 Class Schedule on the Web, <http://www.mcgill.ca/minerva-students/class/>. Class locations and names of instructors are also provided.

Students preparing to register are advised to consult the Class Schedule website for the most up-to-date list of courses available. New courses may have been added or courses rescheduled after this Calendar went to press.

The schedule of courses to be offered in Summer 2003, will be available on the website in January 2003.

OTOL has replaced 540 as the prefix for Otolaryngology courses. The course credit weight is given in parentheses after the title.

OTOL 602 PHYSIOLOGY, HISTOPATHOLOGY AND CLINICAL OTOLARYNGOLOGY 1. (3) (6 hours/week) University and hospital rounds and seminars presenting various topics in Clinical Otolaryngology.

OTOL 603 ADVANCED SCIENTIFIC PRINCIPLES - OTOLARYNGOLOGY 1. (3) (1.5 hours/week) Lectures in advanced basic-science topics of relevance to the otolaryngologist.

OTOL 612 PHYSIOLOGY, HISTOPATHOLOGY AND CLINICAL OTOLARYNGOLOGY 2. (3) (6 hours/week) University and hospital rounds and seminars presenting various additional topics in Clinical Otolaryngology.

OTOL 613 ADVANCED SCIENTIFIC PRINCIPLES - OTOLARYNGOLOGY 2. (3) (1.5 hours/week) Lectures in additional basic-science topics of relevance to the otolaryngologist.

OTOL 690 M.Sc. THESIS 1. (3) A literature search and research proposal under supervision of the research supervisor that leads to a written proposal.

OTOL 691 M.Sc. THESIS 2. (3) Supervised training and research in connection with the Master's thesis.

OTOL 692 M.Sc. THESIS 3. (6) Independent research in connection with the Master's thesis.

OTOL 693 M.Sc. THESIS 4. (6) A seminar and written report to be presented to an ad hoc committee describing appropriate progress at the end of the first year of training.

OTOL 694 M.Sc. THESIS 5. (12) Independent study in connection with the Master's thesis. Presentation of results at a departmental seminar, or at a scientific meeting. Completion and final acceptance of the M.Sc. Thesis by the Department and the Graduate and Postdoctoral Studies Office.

58 Parasitology

Institute of Parasitology
Macdonald Campus
21,111 Lakeshore Road
Sainte-Anne-de-Bellevue, QC H9X 3V9
Canada

Telephone: (514) 398-7722

Fax: (514) 398-7857

Email: pargrsec@po-box.mcgill.ca

Website: <http://www.parasitology.mcgill.ca/>

Director — Professor T. Spithill

58.1 Staff

Professors

Ga etan M. Faubert; B.Sc.(Sher.), M.Sc.(Montr.), Ph.D.(McG.)

Roger Prichard; B.Sc., Ph.D.(N.S.W.) (*CP Professor of Biotechnology*)

Associate Professors

Robin N. Beech; B.Sc.(Nott.), Ph.D.(Edin.)

Kris Chadee; B.Sc.(Winn.), M.Sc.(Man.), Ph.D.(McG.)

Elias Georges; B.Sc., Ph.D.(McG.)

Paula Ribeiro; B.Sc., Ph.D.(York)

Marilyn E. Scott; B.Sc.(U.N.B.), Ph.D.(McG.)

Terence W. Spithill; B.Sc., Ph.D.(Monash)

Assistant Professor

Armando Jardim; B.Sc., Ph.D.(Vic. B.C.)

Associate Members

Mark A. Curtis; B.Sc., M.Sc., Ph.D.(McG.) (*Natural Resource Sciences, Wildlife Biology*)

Gregory J. Matlashewski; B.Sc.(C'dia), Ph.D.(Ott.) (*Medicine, Microbiology & Immunology*)

Manfred E. Rau; B.Sc.(Purdue), M.Sc., Ph.D.(McG.) (*Natural Resource Sciences, Entomology*)

Mary Stevenson; B.A.(Hood), M.Sc., Ph.D.(Catholic U. of Amer.), (*Medicine, Experimental Medicine*)

Brian Ward; M.D.,C.M.(McG.), M.Sc.(Oxon), F.R.C.P.(C) (*Medicine, Experimental Medicine*)

Lecturer

James M. Smith, B.Sc.(N.E. London Polytechnic), Ph.D.(McG.)

58.2 Programs Offered

M.Sc. and Ph.D. degrees in Parasitology, and Graduate Certificate in Biotechnology.

The Institute of Parasitology teaches and researches the phenomenon of parasitism of man and livestock. Current research involvement includes the biology, biochemistry, pharmacology, control, ecology, epidemiology, immunology, molecular biology, neurobiology, and population and molecular genetics of parasitic organisms, viruses and cancer cells.

The Institute is housed in its own building adjacent to the Macdonald Campus Library, and has well equipped laboratories. The Institute has its own animal rooms and has access to large animal facilities at Macdonald farm. The Institute is affiliated to the McGill Centre for Tropical Diseases at the Montreal General Hospital.

Staff at the Institute of Parasitology also coordinate a 15-credit Graduate Certificate in Biotechnology.

58.3 Admission Requirements

Candidates for either the M.Sc. or the Ph.D. degree should possess a Bachelor's degree in the biological or medical sciences with a cumulative grade point average of 3.2/4.0 (Second Class-Upper division). Previous experience in parasitology is not essential.

Candidates for the Graduate Certificate in Biotechnology must possess a Bachelor's degree in Biological Sciences or equivalent with a cumulative grade point average of 3.0/4.0 or 3.2/4.0 in the last two full-time years of university study and prerequisites or equivalents. Prerequisites or equivalents: Students are required to have sufficient background in Biochemistry, Cellular Biology and Molecular Biology, equivalent to at least a 200-level course at McGill University.

58.4 Application Procedures

Applicants for graduate studies through academic units in the Faculty of Agricultural and Environmental Sciences may submit on-line applications via the Web at <http://www.mcgill.ca/applying/graduate> or printed applications. Supporting documents must be sent to:

Student Affairs Office (Graduate Studies)
Macdonald Campus of McGill University
21,111 Lakeshore
Sainte-Anne-de-Bellevue, QC H9X 3V9
Canada

Telephone: (514) 398-7925

Fax: (514) 398-7968

Email: grad@macdonald.mcgill.ca

Applications will be considered upon receipt of a signed and completed application form, \$60 application fee, all official transcripts, two signed original letters of reference on official letterhead of originating institution, and (if required) proof of competency in oral and written English by appropriate exams. DOCUMENTS SUBMITTED WILL NOT BE RETURNED.

Deadlines – Applications, including all supporting documents must reach the Student Affairs Office no later than June 15 (March 1 for International) for the *September session*; October 15 (July 1 for International) for the *January session*; February 15 (November 1 for International) for the *Summer session*. It may be necessary to delay review of the applicant's file until the following admittance period if application materials including supporting documents are received after these dates. International applicants are advised to apply well in advance of the deadline because immigration procedures may be lengthy. Applicants are encouraged to make use of the web-based application form on the McGill website <http://www.mcgill.ca/applying/graduate>

Application Fee (non-refundable) – A fee of \$60 Canadian must accompany each application (including McGill students), otherwise it cannot be considered. This sum must be remitted using one of the following methods:

1. Credit card (by completing the appropriate section of the application form). NB: on-line applications must be paid for by credit card.
2. **Certified** cheque in Cdn.\$ drawn on a Canadian bank.
3. **Certified** cheque in U.S.\$ drawn on a U.S. bank.
4. Canadian Money order in Cdn.\$.
5. U.S. Money Order in U.S.\$.
6. An international draft in Canadian funds drawn on a Canadian bank requested from the applicant's bank in his/her own country.

Transcripts – Two official copies of all transcripts with proof of degree(s) granted are required for admission. Transcripts written in a language other than English or French must be accompanied by a certified translation. An explanation of the grading system used by the applicant's university is essential. It is the applicant's responsibility to arrange for transcripts to be sent.

It is desirable to submit a list of the titles of courses taken in the major subject, since transcripts often give code numbers only. Applicants must be graduates of a university of recognized reputation and hold a Bachelor's degree equivalent to a McGill Honours degree in a subject closely related to the one selected for graduate work. This implies that about one-third of all undergraduate courses should have been devoted to the subject itself and another third to cognate subjects.

The minimum cumulative grade point average (CGPA) is 3.0/4.0 (second-class upper) or 3.2/4.0 during the last two full-time years of university study. High grades are expected in courses considered by the academic unit to be preparatory to the graduate program.

Letters of Recommendation – Two letters of recommendation **on letterhead (official paper) or bearing the university seal** and with original signatures from two instructors familiar with the applicant's work, preferably in the applicant's area of specialization, are required. It is the applicant's responsibility to arrange for these letters to be sent.

Competency in English – Non-Canadian applicants whose mother tongue is not English and who have not completed an undergraduate degree using the English language are required to submit documented proof of competency in oral and written English, by appropriate exams, e.g. TOEFL (minimum score 550 on the paper-based test (213 on the computer-based test) or IELTS (minimum overall band 6.5). The MCHE is not considered equivalent. Results must be submitted as part of the application. The University code is 0935 (McGill University, Montreal); please use Department code 31 (Graduate Schools), Biological Sciences - Agriculture, to ensure that your TOEFL reaches this office without delay.

Graduate Record Exam (GRE) – The GRE is not required, but it is highly recommended.

Financial aid is very limited and highly competitive. It is suggested that students give serious consideration to their financial planning before submitting an application.

Acceptance to all programs depends on a staff member agreeing to serve as the student's supervisor and the student obtaining financial support. Normally, a student will not be accepted unless adequate financial support can be provided by the student and/or the student's supervisor. Academic units cannot guarantee financial support via teaching assistantships or other funds.

Qualifying Students – Some applicants whose academic degrees and standing entitle them to serious consideration for admission to graduate studies, but who are considered inadequately prepared in the subject selected may be admitted to a *Qualifying Program* if they have met the Graduate and Postdoctoral Studies Office minimum CGPA of 3.0/4.0. The course(s) to be taken in a *Qualifying Program* will be prescribed by the academic unit concerned. *Qualifying students* are registered in graduate studies, **but not as candidates for a degree**. Only one qualifying year is permitted. **Successful completion of a qualifying program does not guarantee admission to a degree program.**

58.5 Program Requirements

M.Sc. Degree

Candidates are required to write a research proposal in the second term of their registration to fulfill the requirements of PARA 600. While in the Institute, all students are required to register and participate in the seminar courses PARA 606 and PARA 607. Seminar speakers include students, professors and invited guests. Although emphasis in the graduate program is on research, satisfactory completion of two compulsory 3-credit graduate courses (PARA 635 and PARA 655) is required in the first year of study.

Other course work in related subjects may be required, depending upon the candidates' background and research orientation. In total, a minimum of 14 credits of course work is required and a thesis (courses PARA 687, PARA 688, PARA 689). The minimum requirement of the M.Sc. degree is 46 credits.

Ph.D. Degree

In the first year of the doctoral program, the candidates must successfully complete a written thesis proposal and make an oral presentation on their proposed research to fulfill PARA 700. Satisfactory completion of graduate courses PARA 635 and PARA 655 is required. While in the Institute, all students are required to participate in the seminar courses (PARA 710 and PARA 711).

Graduate Certificate in Biotechnology

For the Graduate Certificate in Biotechnology, students are required to complete 15 credits of courses offered within the Faculties of Agricultural and Environmental Sciences, Medicine, and Science.

Required Courses (6 credits)

BIOT 505 (3) Selected Topics in Biotechnology
BTEC 620 (3) Biotechnology Laboratory

Complementary Courses (9 credits)

One of:

BTEC 621 (3) Biotechnology Management or
EXMD 511 (3) Joint Venturing with Industry

Two courses chosen from the following:

General Topics

ANSC 622 (3) Selected Topics in Molecular Biology
BIOL 468 (3) Topics in Human Genome
BIOL 524 (3) Topics in Molecular Biology
BIOL 551 (3) Molecular Biology: Cell Cycle
BTEC 501 (3) Bioinformatics
BTEC 691 (3) Biotechnology Practicum
EXMD 602 (3) Techniques in Molecular Genetics

Health

EXMD 610 (3) Biochemical Methods in Medical Research
MIMM 466 (3) Viral Pathogenesis and Immunity
PARA 635 (3) Cell Biology and Infection
PHGY 518 (3) Artificial Cells

Environment and Food

ABEN 530 (3) Fermentation Engineering
CELL 500 (3) Techniques in Plant Molecular Genetics
FDSC 535 (3) Food Biotechnology
PLNT 600 (3) Plant Microbe Interactions

58.6 Courses

For the term (Fall and/or Winter), days, and times when courses will be offered, please refer to the 2002-2003 Class Schedule on the Web, <http://www.mcgill.ca/minerva-students/class/>. Class locations and names of instructors are also provided.

Students preparing to register are advised to consult the Class Schedule website for the most up-to-date list of courses available. New courses may have been added or courses rescheduled after this Calendar went to press.

The schedule of courses to be offered in Summer 2003, will be available on the website in January 2003.

BTEC has replaced 394 as the prefix for Biotechnology courses. PARA has replaced 391 as the prefix for Parasitology courses. The course credit weight is given in parentheses after the title.

◆ Departmental approval required for registration.

● Denotes courses not offered in 2002-03.

The following advanced undergraduate courses are available for graduate students in Parasitology.

AEBI 202 CELLULAR BIOLOGY. (3) (Winter) (3 hours of lectures per week) Organization and function of intercellular organelles in eukaryotic cells. Protein synthesis and control of protein transport

within the cell. Cell division and DNA replication. Energy metabolism and electron transport. Signal transduction and transmembrane signalling. Differentiation of cells and cancer. Function and components of the immune system.

AEMA 306 MATHEMATICAL METHODS IN ECOLOGY. (3) (3 hours of lectures per week) (Prerequisite: AEBI 205 or permission. Corequisite: AEMA 310 or permission) An introduction to mathematical and graphical tools for use in ecology. Representation and interpretation of data and associated statistics in graphs and tables; theoretical modelling in plant and animal ecology, including difference and differential equation models. Introduction to stability analysis and probability theory. Emphasis is placed on graphical techniques.

FDSC 211 BIOCHEMISTRY 1. (3) (Fall) (3 lectures) (Corequisite: FDSC 230) Biochemistry of carbohydrates, lipids, proteins, nucleic acids; enzymes and coenzymes. Introduction to intermediary metabolism.

PARA 400 EUKARYOTIC CELLS AND VIRUSES. (3) (4 hours of lectures per week) (Prerequisite: CELL 204) The basic principles of molecular biology and the underlying molecular basis for various methodologies in molecular biology are covered. The molecular genetic basis for viral infections and tumorigenesis will be covered as examples of the use of molecular genetic approaches to address biological problems.

PARA 410 ENVIRONMENT AND INFECTION. (3) (2 lectures per week) (Prerequisite: BIOL 111 or AEBI 120 or equivalent) Infectious pathogens of humans and animals and their impact on the global environment are considered. The central tenet is that infectious pathogens are environmental risk factors. The course considers their impact on the human condition and juxtaposes the impact of control and treatment measures and environmental change.

PARA 438 IMMUNOLOGY. (3) (2 lectures per week) (Prerequisite: AEBI 202 or permission of instructor) An in-depth analysis of the principles of cellular and molecular immunology. The emphasis of the course is on host defense against infection and on diseases caused by abnormal immune responses.

WILD 410 WILDLIFE ECOLOGY. (3) (Winter) (3 hours of lectures per week) (Prerequisite: AEBI 205 or permission) Ecological processes and theories in animal populations. Interrelationships among biological processes, biotic and abiotic factors, and life history strategies. Topics include population dynamics, optimization strategies, predation, habitat selection, risks and decision making, and social behaviour. Application of problem-solving approach to wildlife ecology through individual and group work.

Courses for Higher Degrees

BIOT 505 SELECTED TOPICS IN BIOTECHNOLOGY. (3) (Fall) (Restricted to U3 students) Current methods and recent advances in biological, medical, agricultural and engineering aspects of biotechnology will be described and discussed. An extensive reading list will complement the lecture material.

◆ **BTEC 501 BIOINFORMATICS.** (3) (2 lectures and 1 laboratory per week) This course introduces the application of computer software for analysis of biological sequence information. An emphasis is placed on the biological theory behind analytical techniques, the algorithms used and methods of developing a statistical framework for various types of analysis.

BTEC 620 BIOTECHNOLOGY LABORATORY. (3) (one 8-hour lab per week) Practical training in contemporary methods of molecular and cellular biology. Intended for students with background in molecular biology, biochemistry, or a related area, who are already familiar with theoretical principles of recombinant DNA technologies. Topics include: polymerase chain reaction (PCR), methods for gene cloning and mutagenesis, eukaryotic and prokaryotic gene expression systems, protein purification and methods of eukaryotic cell culture.

BTEC 621 BIOTECHNOLOGY MANAGEMENT. (3) (one 3-hour lecture per week) Topics relevant to the management of research in industry are presented by experts working in industry. This course

highlights the differences existing between research done in an academic environment and research done within industry.

BTEC 691D1 BIOTECHNOLOGY PRACTICUM. (1.5) (Prerequisite: BTEC 620) (Students must also register for BTEC 691D2) (No credit will be given for this course unless both BTEC 691D1 and BTEC 691D2 are successfully completed in consecutive terms) The cooperating employer and the instructor (or designate) will develop an individualized practicum experience program of at least 12 weeks duration for each student.

BTEC 691D2 BIOTECHNOLOGY PRACTICUM. (1.5) (Prerequisite: BTEC 691D1) (No credit will be given for this course unless both BTEC 691D1 and BTEC 691D2 are successfully completed in consecutive terms) See BTEC 691D1 for course description.

PARA 600 THESIS PROPOSAL FOR M.Sc. (4) Comprises a written document outlining the proposed research objectives.

May also be available as: PARA 600D1, PARA 600D2.

PARA 606 PARASITOLOGY SEMINAR. (2) A seminar series in which students present seminars covering topics in parasitology, in areas relevant to their research interests. Students register for the course in their second term of residency. Attendance and participation are compulsory for M.Sc. students.

PARA 607 PARASITOLOGY RESEARCH SEMINAR. (2) This is a required course for M.Sc. students. A seminar course in which students registered at the Institute of Parasitology present seminars on the results of their thesis research. Students register for the course in the final term prior to thesis submission.

PARA 635 CELL BIOLOGY AND INFECTION. (3) (Prerequisite: students with some background in molecular biology) Research articles will be the primary source of information. This course will cover new principles in cell biology. In particular, the mechanisms by which gene expression is regulated through signal transduction pathways initiated at the cell surface will be presented.

PARA 655 HOST-PARASITE INTERACTIONS. (3) Lectures, tutorials and laboratory demonstrations of the principal factors which affect levels of parasite infection and treatment of infections in humans and animals. The integration and management of the host-parasite relationship in terms of transmission, population dynamics, environmental management, behaviour, immune responses, pathology, and pharmacology to decrease parasitic disease.

PARA 665 SPECIAL TOPICS IN PARASITOLOGY. (3) This course designation will be used for special courses that staff, or visiting professors, may wish to provide when student interest warrants. Examples might include a laboratory techniques course, a mathematical modelling course or a special pharmacology seminar series.

PARA 687 THESIS RESEARCH 1. (10)

PARA 688 THESIS RESEARCH 2. (10)

PARA 689 THESIS RESEARCH 3. (12)

PARA 700 THESIS PROPOSAL FOR PH.D. (0) Comprises a written document outlining the proposed research objectives.

May also be available as: PARA 700D1, PARA 700D2.

PARA 710 PARASITOLOGY PH.D. SEMINAR 1. (2) This first seminar is a review of the scientific literature in the topic area of the thesis research.

PARA 711 PARASITOLOGY PH.D. SEMINAR 2. (2) A seminar series in which students present seminars covering topics in parasitology in areas relevant to their research interests. Attendance and participation are compulsory.

59 Pathology

Department of Pathology
Duff Medical Building
3775 University Street
Montreal, QC H3A 2B4
Canada

Telephone: (514) 398-7192 Ext. 00481 or 00494
Fax: (514) 398-7446
Email: mira.hoffmann@mcgill.ca
Website: <http://www.mcgill.ca/pathology>

Chair — C.C. Compton

Director of Graduate Program — E. Zorychta

59.1 Staff

Professors

M.N. Burnier Jr.; M.D., M.Sc., Ph.D.(Brazil)
C.C. Compton; B.A. M.D., Ph.D.(Harv.)
A.M.V. Duncan; B.Sc.(Queen's), Ph.D.(Edin.)
A. Ferenczy; B.A., B.Sc., M.D.(Montr.)
R. Fraser; B.Sc., M.D., C.M.(McG.), M.Sc.(Glas.), F.R.C.P.(C)
A. Fuks; B.Sc., M.D., C.M.(McG.)
D. Haegert; M.D.(British Columbia), F.R.C.P.(C)
Q.A. Hamid; M.D.(Mosul), Ph.D.(Lond.) (*James McGill Professor*)
(*joint appt. with Medicine*)
J.R. Jass; M.B.B.S., M.D.(London), F.R.C.Path
R.P. Michel; B.Sc., M.D., C.M.(McG.), F.R.C.P.(C)
G. Prud'homme; B.Sc., M.D.(Ott.), F.R.C.P.(C)
J.B. Richardson; B.Sc., M.D., C.M., Ph.D.(McG.), F.R.C.P.(C)

Associate Professors

L. Alpert; M.D., Ph.D.(Tufts)
J. Arseneau; M.D.(Laval), F.R.C.P.(C)
M. Auger; M.D., C.M.(McG.), F.R.C.P.(C)
M.L. Brisson; B.A.(Paris), B.Sc., M.D.(Montr.)
B. Case; B.Sc., M.D., C.M., M.Sc.(McG.), Dipl. Occ. Hyg.,
F.R.C.P.(C)
M.F. Chen; M.B., B.S.(Monash), F.R.C.P.(C)
J. Deschênes; M.D.(Laval), F.R.C.P.(C)
L.B. Eidus; M.D.(Ott.), F.R.C.P.(C)
A. Giaid; D.V.M.S.(Baghdad), Ph.D.(Lond.)
R.H. Latt; D.V.M.(Guelph)
L.A. Oliva; M.D.(St. Domingue), F.R.C.P.(C)
R. Onerheim; M.D.(Alta.), F.R.C.P.(C)
L. Rochon; M.D.(Sher.), F.R.C.P.(C)
S. Tange; B.A., M.D.(Minn.)
M. Trudel; B.Sc., M.D.(Ott.), F.R.C.P.(C)
J. Vioria; M.D.(Philip.), F.R.C.P.(C)
K. Watters; B.Sc., M.D., C.M.(McG.), F.R.C.P.(C)
E.A. Zorychta; B.Sc.(St.F.X.), M.Sc., Ph.D.(McG.)

Assistant Professors

S. Albrecht; M.D.(Sher.), F.R.C.P.(C)
C. Bernard; M.D.(Sherb.)
C. Catzavelos; M.D.(Cape Town), F.R.C.P.(C)
P.J. Chauvin; M.Sc.(W.Ont.), D.D.S.(McG.)
J. Emond; B.A., M.Sc., M.D.(Montr.)
M.-C. Guiot; B.Sc., M.D.(Bordeaux)
F. Halwani; M.D.(Iran), Ph.D.(McG.), F.R.C.P.(C)
E. Lamoureux; B.Sc., M.D.(Montr.), F.R.C.P.(C)
A.T. Marcus; B.Sc., M.D., C.M.(McG.), F.R.C.P.(C)
V.A. Marcus; M.D., C.M.(McG.), F.R.C.P.(C)
J. Massé; M.D.(Sher.)
A.R. Mehio; M.D.(Leb.)
A. Nahal; M.D.(Aleppo)
V.-H. Nguyen; M.D.(Montr.), F.R.C.P.(C)
A. Pélouquin; M.D.(Sher.), F.R.C.S.(C), F.R.C.P.(C)
D. Pilavdzic; M.D.(Zagreb), F.R.C.P.(C)
I. Roy; B.Sc., M.D., C.M.(McG.), F.R.C.P.(C)
H. Srolovitz; B.Sc.(Pitt.), M.D.(Basle)
J. St. Cyr; M.D., C.M.(McG.), F.R.C.P.(C)

Adjunct Professors

T. Seemayer, University of Nebraska Medical Centre
P.D. Winocour, BioChem Therapeutic Inc.

59.2 Programs Offered

M.Sc. and Ph.D. degrees in Pathology.

The Pathology Department offers research training in a wide variety of areas such as atherosclerosis, immunology and transplantation, neoplasia, cell biology, pulmonary vascular and airways disease, pulmonary edema, neurodegenerative disorders, and smooth muscle pathophysiology.

Modern techniques and equipment include light, fluorescence and electron microscopy (both transmission and scanning), cell culture, advanced immunological, pharmacological, biochemical and physiological techniques, as well as morphometry and computers.

59.3 Admission Requirements

Applicants must have a B.Sc. or the equivalent degree with an extensive background in the physical and biological sciences. An academic record equivalent to or better than a CGPA of 3.2 out of 4 at McGill is required for at least the two final full-time years of undergraduate training with a minimum CGPA of 3.0 overall.

Non-Canadian students may be required to take the GRE and TOEFL examinations in order to properly evaluate their suitability. Students are normally accepted into the M.Sc. program, and those candidates showing exceptional ability may be permitted to transfer into the Ph.D. program after one year of training.

Applicants who already possess an additional degree (M.Sc., M.D.) and have some research experience may be allowed to register in the Ph.D. program directly.

Prospective students are encouraged to contact the Teaching Office, Department of Pathology, for application forms and a departmental brochure containing the research interests of the academic staff.

59.4 Application Procedures

Applications will be considered upon receipt of:

1. application;
2. transcripts;
3. letters of reference;
4. \$60 application fee;
5. test results (GRE, TOEFL).

All information is to be submitted directly to the Pathology Teaching Office.

All applications will be evaluated by the Graduate Students Committee. Candidates found suitable must then be accepted by a research director, and adequate funding must be obtained for both personal support and research expenses.

Commencing with applications for entry in January 2003, McGill's on-line application form will be available to all graduate program candidates at <http://www.mcgill.ca/applying/graduate>.

59.5 Program Requirements

All students must take PATH 300 plus a course in statistics if they have not completed these requirements before admission.

Candidates with insufficient background in one of the biomedical sciences will be required to take specific courses to remedy the deficiency. These and additional courses which are relevant to the student's area of research will be chosen in consultation with the research director and Graduate Students Committee.

M.Sc. Program Requirements

The program consists of 45 credits, 30 credits obtained by laboratory work and submission of a thesis (PATH 690, PATH 691, PATH 692), with the remaining 15 course credits to be distributed as follows: PATH 613 or PATH 614, PATH 620, PATH 622, plus any two graduate level courses offered by the Department. A graduate course in another department may be substituted for one of the Pathology graduate courses upon approval by the research director and Graduate Students Committee.

Ph.D. Program Requirements

Ph.D. candidates are required to complete courses PATH 613, PATH 614, PATH 620, PATH 622, PATH 701, plus any three graduate level courses offered by the Department, and any additional courses considered necessary by the research director or the Graduate Students Committee.

Candidates will be evaluated primarily on their ability to conduct independent research and submit a thesis, which must be defended orally.

59.6 Courses

For the term (Fall and/or Winter), days, and times when courses will be offered, please refer to the 2002-2003 Class Schedule on the Web, <http://www.mcgill.ca/minerva-students/class/>. Class locations and names of instructors are also provided.

Students preparing to register are advised to consult the Class Schedule website for the most up-to-date list of courses available. New courses may have been added or courses rescheduled after this Calendar went to press.

The schedule of courses to be offered in Summer 2003, will be available on the website in January 2003.

NOTE: All undergraduate courses administered by the Faculty of Science (courses at the 100- to 500-level) have limited enrolment.

PATH has replaced 546 as the prefix for Pathology courses. The course credit weight is given in parentheses after the title.

- Denotes courses not offered in 2002-03

Advanced Undergraduate

PATH 300 HUMAN DISEASE. (3) (Winter) (Prerequisites: BIOL 200, BIOL 201 or BIOC 212, PHGY 209. Pre-/co-requisite: PHGY 210) Provides a fundamental understanding of the diseases prevalent in North America, for upper level students in the biological sciences. Includes: general responses of cells and organ systems to injury; assessment of individual diseases by relating the causes, symptoms, diagnosis, treatment and prevention to the primary biological abnormalities in each disorder.

Graduate Courses

The following courses are given in a variable sequence depending on the interests and requirements of graduate students enrolled in the Department.

- **PATH 607 BIOCHEMICAL PATHOLOGY.** (3)
- PATH 613 RESEARCH TOPICS IN PATHOLOGY.** (3)
- PATH 614 RESEARCH TOPICS IN PATHOLOGY.** (3)
- PATH 620 RESEARCH SEMINAR 1.** (3)
- PATH 622 RESEARCH SEMINAR 2.** (3)
- **PATH 650 IMMUNOPATHOLOGY.** (3)
- **PATH 651 PATHOBIOLOGY OF ARTERIAL WALL.** (3)
- **PATH 652 MOLECULAR BIOLOGY OF DISEASE.** (3)

PATH 653 READING AND CONFERENCE. (3) (Offered in conjunction with the Department of Human Genetics.) Cytogenetics is the science and art of making and analyzing chromosome preparations. This course focuses on human chromosomes, although methodologies and principles apply broadly to other species as well. Basic facts and mysteries about chromosomes will be explained and discussed in the light of clinical examples.

- PATH 690 M.Sc. THESIS RESEARCH PROJECT 1.** (9)
- PATH 691 M.Sc. THESIS RESEARCH PROJECT 2.** (9)
- PATH 692 M.Sc. THESIS RESEARCH PROJECT 3.** (12)

PATH 701D1 COMPREHENSIVE EXAMINATION - Ph.D. CANDIDATES. (0) (Students must also register for PATH 701D2) (No credit will be given for this course unless both PATH 701D1 and PATH 701D2 are successfully completed in consecutive terms)

PATH 701D2 COMPREHENSIVE EXAMINATION - Ph.D. CANDIDATES. (0) (Prerequisite: PATH 701D1) (No credit will be given for this course unless both PATH 701D1 and PATH 701D2 are successfully completed in consecutive terms) .

60 Pharmacology and Therapeutics

Department of Pharmacology and Therapeutics
McIntyre Medical Sciences Building
3655 Promenade Sir-William-Osler, Room 1325
Montreal, QC H3G 1Y6
Canada

Telephone: (514) 398-3623

Fax: (514) 398-6690

Email: pmoore@pharma.mcgill.ca

Website: <http://www.medicine.mcgill.ca/pharma>

Chair — T.B.A.

Acting Chair — R. Capek

Chair, Graduate Committee — B. Hales

60.1 Staff*Emeritus Professor*

T. Sourkes; Ph.D.(C'neil)

Professors

R. Capek; M.D., Ph.D.(Prague)

P.B.S. Clarke; M.A.(Cantab.), Ph.D.(Lond.)

B. Collier; Ph.D.(Leeds)

A.C. Cuello; M.D.(Buenos Aires), D.Sc.(Oxon), F.R.S.C.

B. Hales; Ph.D.(McG.)

P.J. McLeod; M.D.(Man.), F.R.C.P.(C)

J.B. Richardson; M.D., C.M., Ph.D.(McG.)

B. Robaire; Ph.D.(McG.)

M. Szyf; Ph.D.(Hebrew Univ.)

D.R. Varma; M.D.(L'now), Ph.D.(McG.)

Associate Professors

G. Almazan; Ph.D.(McG.)

B. Esplin; M.D.(Warsaw)

D. Maysinger; Ph.D.(S. Calif.)

S. Nattel; M.D. C.M.(McG.)

A.L. Padjen; M.D., Ph.D.(Zagreb)

A. Ribeiro-da-Silva; M.D., Ph.D.(Oporto)

H. Saragovi; Ph.D.(Miami)

B.I. Sasyniuk; Ph.D.(Man.)

J. Trasler; M.D., C.M., Ph.D.(McG.)

E. Zorychta; Ph.D.(McG.)

Associate Members

M. Alaoui-Jamali; Ph.D.(Sorbonne)

G. Batist; M.D., C.M.(McG.)

C. de Montigny; M.D., Ph.D.(Montr.), F.R.C.P.(C)

P. Fiset; M.D.(Laval), F.R.C.P.S.(C)

S. Gauthier; M.D.(Montr.)

Y. Patel; M.D.(Otago) Ph.D.(Monash) F.R.A.C.P., F.R.C.P.(C)

R. Prichard; Ph.D.(N.S.W.)

R. Quirion; Ph.D.(Sher.)

A. Tenenhouse; M.D., C.M., Ph.D.(McG.)

Adjunct Professors

S. Chemtob; M.D., Ph.D.(Montr.), F.R.C.P.(C)

Y. de Koninck; Ph.D.(McG.)

L. Garofalo; Ph.D.(McG.)

J. Mancini; Ph.D.(McG.)

G.S. Robertson; Ph.D.(Dal.)

60.2 Programs Offered

The Department of Pharmacology and Therapeutics offers training leading to M.Sc. (thesis), M.Sc. Applied (non-thesis) and Ph.D. degrees.

Pharmacology is a multi-disciplinary science which deals with all aspects of drugs and their interactions with living organisms. Thus, pharmacologists study the physical and chemical properties of drugs, their biochemical and physiological effects, mechanisms of action, pharmacokinetics and therapeutic and other uses. The Department offers broad exposure and training in both basic and

clinical research in areas of specialty ranging from neuropharmacology, reproductive, endocrine, receptor, cardiovascular, cancer, developmental, autonomic, clinical and biochemical pharmacology, molecular biology, to toxicology.

The present 35 full and affiliate members of the Department have research laboratories located in the McIntyre Medical Sciences Building and in a variety of hospitals, institutes and industry including the Douglas Hospital Research Center, Allan Memorial Institute, Montreal Children's Hospital, Montreal General Hospital, Royal Victoria Hospital, Montreal Heart Institute, Lady Davis Research Institute, Pfizer Canada and Merck Frosst Canada Inc. The participation of researchers from both industry and government ensures the relevance of the Department's applications-oriented training programs.

60.3 Admission Requirements

Candidates are required to hold a B.Sc. degree in a discipline relevant to the proposed field of study; those with the M.D., D.D.S. or D.V.M. degrees are also eligible to apply. A background in the health sciences is recommended, but programs in biology, chemistry, mathematics, and physical sciences may be acceptable.

Admission is based on a student's academic record, letters of assessment, and, whenever possible, interviews with staff members. Non-Canadian students are required to take the Graduate Record Examination Aptitude Test (GRE) and the Test of English as a Foreign Language (TOEFL) or the equivalents.

Inquiries relating to all aspects of graduate study should be directed to the Graduate Coordinator, Department of Pharmacology and Therapeutics as early as possible in each academic year.

60.4 Application Procedures

Applications will be considered upon receipt of:

1. Completed official McGill University application form; available via internet at <http://www.mcgill.ca/applying/graduate>.
2. Curriculum vitae including a statement of research interests.
3. Two copies of official transcripts sent directly from all universities attended.
4. Two confidential letters of recommendation from professors or research-related employers (at least one should be from an academic known to the international scientific community).
5. Application fee (\$60 Canadian or U.S. Funds) payable by credit card for on-line applications; by money order, certified personal cheque, or bank draft enclosed with the official paper application form.
6. Official GRE and TOEFL scores (not required of applicants from Canada).

Applications and all documents should be submitted directly to the Graduate Co-ordinator, Mrs. Pam Moore, in the Department of Pharmacology.

Deadlines

September Admission:

Canadian/Permanent Resident applicants – July 1st
(including interviews with graduate committee members).

International applicants – March 1st.

January Admission:

Canadian/Permanent Resident applicants – October 1st
(including interviews with graduate committee members).

International applicants – August 1st.

60.5 Program Requirements

The objective of the M.Sc. (thesis) and Ph.D. degree training programs is to provide in-depth independent research experience in a specific area of pharmacology.

M.Sc. (Thesis) (45 credits)

In addition to a M.Sc. Thesis, the specific requirements are as follows:

1. Complete PHAR 601 Comprehensive Examination (9 credits)
2. Plus PHAR 712 Statistics for Pharmacologists (3 credits)

3. *PHAR 562 General Pharmacology 1 and PHAR 563 General Pharmacology 2 or their equivalent (6 credits)
*Students who have taken PHAR 562 and PHAR 563 as part of their undergraduate degree must register for PHAR 697 Thesis Preparation 1 (6 credits)
4. Two 700-level graduate courses in Pharmacology (3 credits each)

The M.Sc. program consists of 45 credits, a minimum of 18 credits are required in addition to thesis preparation courses PHAR 696, PHAR 698 and PHAR 699 (3, 9 and 12 credits respectively).

Ph.D. (Thesis)

Students enrolled in the Ph.D. program must successfully complete or be exempted from the same courses as for the M.Sc. degree, plus one additional 700-level graduate course (for total of three), in addition to a Ph.D. thesis.

M.Sc. (Applied) degree

(Please check with the Department for the availability of this program for the 2002-03 academic year.)

The objective of the M.Sc. Applied program is to provide a broad exposure and training in Pharmacology, with two terms of courses and two of research, one of which may be completed during the summer.

The course requirements (45 credits) are as follows: PHAR 562 and PHAR 563, General Pharmacology 1 and 2, or their equivalents; PHAR 712, Statistics for Pharmacologists; PHAR 603, Drug Discovery and Development; one 700 level Pharmacology graduate course; PHAR 604, Advanced independent research project in pharmacology; PHAR 605, Advanced independent research project in applied pharmacology, plus three complementary courses to be chosen from options in Epidemiology, Experimental Medicine, Biotechnology, Bioethics, Biochemistry, Physiology, Microbiology and Immunology, Pathology, and Economics.

60.6 Courses for Higher Degrees

For the term (Fall and/or Winter), days, and times when courses will be offered, please refer to the 2002-2003 Class Schedule on the Web, <http://www.mcgill.ca/minerva-students/class/>. Class locations and names of instructors are also provided.

Students preparing to register are advised to consult the Class Schedule website for the most up-to-date list of courses available. New courses may have been added or courses rescheduled after this Calendar went to press.

The schedule of courses to be offered in Summer 2003, will be available on the website in January 2003.

PHAR has replaced 549 as the prefix for Pharmacology courses. The course credit weight is given in parentheses after the title.

The following courses are designed primarily for graduate students in the Department, but may be attended by others under special circumstances. These courses are given in a rotational sequence and students may register according to their specific requirements and interests.

- Denotes courses not offered in 2002-03

PHAR 601D1 COMPREHENSIVE. (4.5) (Students must also register for PHAR 601D2) (No credit will be given for this course unless both PHAR 601D1 and PHAR 601D2 are successfully completed in consecutive terms)

PHAR 601D2 COMPREHENSIVE. (4.5) (Prerequisite: PHAR 601D1) (No credit will be given for this course unless both PHAR 601D1 and PHAR 601D2 are successfully completed in consecutive terms)

- **PHAR 602 PRINCIPLES OF PHARMACOLOGY.** (3)
- **PHAR 602D1 PRINCIPLES OF PHARMACOLOGY.** (1.5)
- **PHAR 602D2 PRINCIPLES OF PHARMACOLOGY.** (1.5)
- **PHAR 603 DRUG DISCOVERY AND DEVELOPMENT.** (6)
- **PHAR 604 RESEARCH PROJECT 1.** (9)

- **PHAR 605 RESEARCH PROJECT 2.** (9)
- PHAR 696 THESIS PREPARATION.** (3)
- PHAR 697 THESIS PREPARATION 1.** (6)
- PHAR 698 THESIS PREPARATION 2.** (9)
- PHAR 699 THESIS PREPARATION 3.** (12)
- **PHAR 702 BIOCHEMICAL PHARMACOLOGY.** (3)
- PHAR 703 NEUROPHARMACOLOGY.** (3) The basic actions of drugs affecting axonal conduction and synaptic transmission, with particular emphasis on the central nervous system and its functions.
- **PHAR 704 DRUG DISTRIBUTION, METABOLISM AND EXCRETION.** (3)
- **PHAR 705 CARDIOVASCULAR REGULATION AND DRUG ACTION.** (3)
- **PHAR 706 CHEMICAL MEDIATORS AND AUTONOMIC DRUGS.** (3)
- PHAR 707 MOLECULAR PHARMACOLOGY.** (3) Actions of drugs on specific tissue receptors; enzymes or other macromolecular species in living cells.
- PHAR 712 STATISTICS FOR PHARMACOLOGISTS.** (3) Basic theoretical and practical aspects of statistics for pharmacologists.
- **PHAR 713 DEVELOPMENTAL PHARMACOLOGY.** (3)
- **PHAR 714 ENDOCRINE PHARMACOLOGY.** (3)

61 Philosophy

Department of Philosophy
Leacock Building, Room 908
855 Sherbrooke Street West
Montreal, QC H3A 2T7
Canada

Telephone: (514) 398-6060

Fax: (514) 398-7148

Email: info.philosophy@mcgill.ca

Website: <http://www.arts.mcgill.ca/programs/phil>

Chair — R.P. Buckley

61.1 Staff

Emeritus Professors

R. Klibansky; M.A.(Oxon.), D.Phil.(Heidel.), F.R.Hist. F.R.S.C.

(*John Frothingham Emeritus Professor of Logic and Metaphysics*)

A.T. McKinnon; M.A.(Tor.), Ph.D.(Edin.), B.D.(McG.), F.R.S.C., R.D., D.H.L.(St. Olaf) (*William C. Macdonald Emeritus Professor of Moral Philosophy*)

D. Norton; M.A.(Claremont), Ph.D.(Calif.), F.R.S.C.

C. Taylor; M.A., D.Phil.(Oxon.), F.R.S.C.

Professors

M.A. Bunge; Ph.D.(LaPlata), F.R.S.C. (*John Frothingham Professor of Logic and Metaphysics*)

G. DiGiovanni; B.A., M.A., S.T.B., Ph.D.(Tor.)

S. McCall; B.A.(McG.), B.Phil., D.Phil.(Oxon.)

Associate Professors

R.P. Buckley; Ph.D.(Louvain)

D. Davies; B.A. (Oxon.), M.A.(Manit.), Ph.D.(W.Ont.)

M. Deslauriers; B.A.(McG.), M.A., Ph.D.(Tor.)

M. Hallett; B.Sc., Ph.D.(Lond.)

A. Laywine; B.A.(Ott.), M.A.(Montr.), Ph.D.(Chic.)

E. Lewis; B.A.(C'neil), Ph.D.(Ill. at Chic.)

J. McGilvray; B.A.(Carleton College), Ph.D.(Yale)

S. Menn; M.A., Ph.D.(Chic.), M.A., Ph.D.(Johns H.)

S. Stroud; A.B.(Harv.), Ph.D.(Prin.)

Assistant Professors

R. Brown; B.A., M.Phil.(Cambridge), Ph.D.(M.I.T.)

E. Carson; M.A.(McG.), Ph.D.(Harv.)

G. Mikkelsen; M.S., Ph.D.(Chic.) (*joint appt. with McGill School of Environment*)

Adjunct Professors

S. Davis (Simon Fraser)

I. Gold (Monash)

Auxiliary Professor

K. Arvanitakis; B.Sc, M.A., M.D., C.M.(McG.), D.Psy., C.I.P.C., C.C.M.Q., F.R.C.P., R.S.M.A.(UK) (Can. Institute of Psychoanalysis)

Associate Members

R. Hayes (Religious Studies)

L. Kaplan (Jewish Studies)

A. Patten (Political Science)

Visiting Professor

G.A. Cohen; (Chicele Professor of Social and Political Theory, University of Oxford)

61.2 Programs Offered

The Department offers courses of study leading to the Ph.D. in Philosophy. It also offers, in conjunction with the Biomedical Ethics Unit, a course of study leading to the M.A. degree in Bioethics.

61.3 Admission Requirements

Ph.D. Students with an Honours B.A. degree in philosophy, or the equivalent, are normally admitted to the Ph.D. program directly at the Ph.D.I level. The Department considers an Honours B.A. degree to include:

- 1) A general knowledge of the history of Western philosophy: Greek, Medieval, Modern.
- 2) A systematic knowledge of the main philosophical disciplines in their contemporary as well as historical contexts: logic, ethics, epistemology, and metaphysics.
- 3) An ability to present, in written form, clear and substantial reconstructions and analyses of the materials normally studied in the areas mentioned in (1) and (2).

To demonstrate their competence in these areas applicants must submit transcripts of academic work, three letters of recommendation from persons with whom they have studied, and at least one substantial example (approximately 15-20 typewritten pages) of their written philosophical work.

In addition, applicants from North America whose first language is English are required to submit scores of the Graduate Record Examination. Non-Canadian applicants whose mother tongue is not English and who have not completed an undergraduate degree from a recognized institution where English is the language of instruction are required to submit documented proof of competency in oral and written English (TOEFL score).

Students who hold an M.A. degree from another institution should apply for admission at the Ph.D. II level; such students will normally be required to complete two years of course work.

M.A. (Bioethics) Students applying to the Bioethics Specialty program must write an M.A. thesis proposal. All applications to this program must also receive the approval of the Director of the Specialty program. Students who apply for this program should note that they must participate in a practicum which continues beyond the end of their second term of classes.

61.4 Application Procedures

Ph.D.: Applications and all documents **must** be submitted by January 15.

Applications will be considered upon receipt of:

1. duly completed application form;
2. two (2) official transcripts of all post-secondary studies;
3. three (3) original letters of reference;
4. \$60 application fee;
5. test results (GRE, TOEFL);
6. writing sample;
7. statement of purpose.

All information is to be submitted to the Department of Philosophy.

M.A. specialization in Bioethics: Applications are made initially through the Biomedical Ethics Unit in the Faculty of Medicine, which administers the program and teaches the core courses.

Applicants must be accepted first by the Department of Philosophy and then by the Bioethics Graduate Studies Advisory Committee.

For information, please contact the Chair, Master's Specialization in Bioethics, Biomedical Ethics Unit, 3690 Peel Street, Montreal, QC, H3A 1W9. Telephone: (514) 398-6980. Fax: (514) 398-8349. Email: kathleen.glass@mcgill.ca.

Commencing with applications for entry in January 2003, McGill's on-line application form will be available to all graduate program candidates at <http://www.mcgill.ca/applying/graduate>.

61.5 Program Requirements

The course work for the first four terms of the Ph.D. program will include two pro-seminars, in two of the following three areas: Value theory; Metaphysics and Epistemology; History of Philosophy. Each seminar will be led by two members of staff, and the grade for the seminar will be determined jointly by them. Each academic year, the Chair will invite joint proposals from staff for topics for the following year's pro-seminar and will, if necessary, choose among proposals, ensuring that the topics offered in successive years do not fall within the same area as defined above. The Chair will also consult with graduate students in Ph.D. concerning the topic of the pro-seminar for the following year. The pro-seminar will normally be offered in the fall semester.

The course work taken towards completion of the requirements for the Ph.D. program must satisfy certain distribution requirements. Students must take at least two graduate courses in each of the following three areas: Value Theory; Metaphysics and Epistemology; History of Philosophy. Pro-seminars (6 credits each) may be counted in partial satisfaction of these requirements. The Graduate Director, in consultation with the student's advisory committee, will determine for which area(s) a given course may be counted. Students are entitled to appeal such decisions to the Department as a whole. No student may count a given course towards the satisfaction of the distribution requirements for more than one area.

By the end of the Ph.D. II year, a student must submit a research paper (the "candidacy paper" [3 credits]), which may be worked up from a paper written to fulfill the requirements of a graduate course, to a Thesis Advancement Committee consisting of at least two members of the staff of the Department. The membership of this committee will be determined by the Graduate Director in consultation with the student; it is anticipated that members of this committee would, in principle, direct the student's thesis. This committee assigns a grade to the student's paper and reviews her or his graduate performance; on the basis of its assessment and review, it recommends to the Department as a whole either to permit the student to continue with the Ph.D. program and undertake a thesis or to decline to permit the student to continue. Two necessary conditions for a positive recommendation are that the student (a) receive a grade of at least B+ on the candidacy paper, and (b) have at least a 3.5 GPA (on the undergraduate Grade Point scale) in the course work required for the program. The Department as a whole, taking into account the Thesis Advancement Committee's recommendation and the student's overall academic record in the program, decides whether to permit the student to continue.

Students who do not receive a positive recommendation but who satisfy Graduate and Postdoctoral Studies Office requirements (no courses below a B-minus and completion of 45 credits) will be recommended to the Graduate and Postdoctoral Studies Office by the Department to transfer from the Ph.D. program to the M.A. program.

M.A. specialization in Bioethics: The curriculum is composed of required courses (for 6 credits) offered in the Biomedical Ethics Unit, bioethics courses (3 credit minimum) offered by Philosophy and any graduate courses required or accepted by Philosophy for the granting of a Master's degree, for a total of 18 to 21 credits. A

minimum of 45 credits is required including the thesis. For further information refer to the Bioethics entry.

61.6 Courses for Higher Degrees

For the term (Fall and/or Winter), days, and times when courses will be offered, please refer to the 2002-2003 Class Schedule on the Web, <http://www.mcgill.ca/minerva-students/class/>. Class locations and names of instructors are also provided.

Students preparing to register are advised to consult the Class Schedule website for the most up-to-date list of courses available. New courses may have been added or courses rescheduled after this Calendar went to press.

The schedule of courses to be offered in Summer 2003, will be available on the website in January 2003.

NOTE: All undergraduate courses administered by the Faculty of Arts courses at the 100- to 500-level) have limited enrolment.

PHIL has replaced 107 as the prefix for Philosophy courses.

The course credit weight is given in parentheses after the title.

● Denotes courses not offered in 2002-03

PHIL 210 INTRODUCTION TO DEDUCTIVE LOGIC 1. (3) (Not open to students who are taking or have taken MATH 318) An introduction to propositional and predicate logic; formalization of arguments, truth tables, systems of deduction, elementary metaresults, and related topics.

PHIL 310 INTERMEDIATE LOGIC. (3) (Prerequisite: PHIL 210 or equivalent) A second course in Logic. NB. The course will be technical in nature, and some mathematical aptitude is essential. The emphasis is on the expressive properties of standard logical systems, including implications for the philosophy of mathematics. We will study the Completeness of First-Order Logic, then the 'limitative' theorems of Tarski and Gödel.

PHIL 506 SEMINAR: PHILOSOPHY OF MIND. (3) (Prerequisite: PHIL 306) An advanced course devoted to specific topics in the philosophy of mind..

● **PHIL 507 SEMINAR: COGNITIVE SCIENCE.** (3) (Prerequisites: PHIL 306, PHIL 415 or written permission of the instructor)

● **PHIL 510 SEMINAR: ADVANCED LOGIC 2.** (3) (Prerequisite: PHIL 310 or written permission of the instructor)

● **PHIL 511 SEMINAR: PHILOSOPHY OF LOGIC AND MATHEMATICS.** (3)

● **PHIL 515 SEMINAR: PHILOSOPHY OF LANGUAGE.** (3) (Prerequisite: PHIL 415 or written permission of the instructor)

● **PHIL 519 SEMINAR: EPISTEMOLOGY.** (3) (Prerequisite: PHIL 420 or written permission of the instructor)

PHIL 521 SEMINAR: METAPHYSICS. (3) (Prerequisite: PHIL 421 or written permission of the instructor) An advanced course devoted to a topic in metaphysics.

PHIL 534 SEMINAR: ETHICS. (3) (Prerequisite: PHIL 334 or written permission of the instructor)

PHIL 541 SEMINAR: PHILOSOPHY OF SCIENCE. (3) (Prerequisite: PHIL 441 or other requirements specified by the instructor) An advanced course devoted to a topic in the philosophy of science.

PHIL 543 SEMINAR: MEDICAL ETHICS. (3) (Prerequisite: PHIL 343 or written permission of the instructor) An advanced course devoted to a particular philosophical problem as it arises in the context of medical practice or the application of medical technology.

PHIL 544 POLITICAL THEORY. (3)

● **PHIL 548 SEMINAR: PHILOSOPHY OF LAW.** (3) (Prerequisite: PHIL 348 or written permission of the instructor)

PHIL 551 SEMINAR: ANCIENT PHILOSOPHY 2. (3) (Prerequisite: at least one course in ancient philosophy and the specific requirements of individual instructors) An advanced course on a philosopher or philosophical issue articulated in antiquity.

- **PHIL 556 SEMINAR: MEDIEVAL PHILOSOPHY.** (3) (Prerequisite: PHIL 345 or PHIL 357 or written permission of the instructor)
- **PHIL 560 SEMINAR: 17TH CENTURY PHILOSOPHY.** (3) (Prerequisite: PHIL 360 or written permission of the instructor)
- PHIL 561 SEMINAR: 18TH CENTURY PHILOSOPHY.** (3) (Prerequisite: PHIL 361 or written permission of the instructor) An advanced course on an eighteenth-century philosopher or philosophical issue.
- PHIL 567 SEMINAR: 19TH CENTURY PHILOSOPHY.** (3) (Prerequisite: PHIL 366 or PHIL 367 or written permission of the instructor) An advanced course on 19th-century philosophy or philosophical issue.
- **PHIL 570 SEMINAR: CONTEMPORARY ANALYTIC PHILOSOPHY.** (3) (Prerequisite: PHIL 370 or PHIL 415 or written permission of the instructor)
- PHIL 575 SEMINAR: CONTEMPORARY EUROPEAN PHILOSOPHY.** (3) (Prerequisite: PHIL 475 or written permission of the instructor) An advanced course on contemporary European philosophy or some important issue in the Continental tradition.
- PHIL 580 SEMINAR: PROBLEMS OF PHILOSOPHY 1.** (3)
- PHIL 581 SEMINAR: PROBLEMS OF PHILOSOPHY.** (3)
- PHIL 590 SEMINAR: SPECIAL TOPICS IN PHILOSOPHY.** (3) (Prerequisites: one course in philosophy) Psychoanalysis: a critical examination. Depending on the interests of the class, areas covered would include: psychoanalytic epistemology, psychoanalysis and the pre-socratics, psychoanalysis and tragedy, reasons versus causes in psychoanalysis, hermeneutics, psychoanalytic truth, self-deception, irrationality, paradox, creativity, internal object world and its relation to external objects.
- **PHIL 601 SEMINAR: HISTORY OF PHILOSOPHY 1.** (3)
- **PHIL 602 SEMINAR: HISTORY OF PHILOSOPHY 2.** (3)
- **PHIL 603 SEMINAR: METAPHYSICS AND EPISTEMOLOGY 1.** (3)
- **PHIL 604 SEMINAR: METAPHYSICS AND EPISTEMOLOGY 2.** (3)
- **PHIL 605 SEMINAR: VALUE THEORY 1.** (3)
- **PHIL 606 SEMINAR: VALUE THEORY 2.** (3)
- PHIL 607 PRO-SEMINAR 1.** (6) A series of seminars on selected topics designed for professional training to graduate students. Topics will be selected from the general area of Value Theory.
- **PHIL 608 PRO-SEMINAR 2.** (6)
- **PHIL 640 SEMINAR: FOUNDATIONS OF SCIENCE 1.** (3)
- **PHIL 641 SEMINAR: FOUNDATIONS OF SCIENCE 2.** (3)
- **PHIL 656 17TH AND 18TH CENTURY PHILOSOPHY.** (3)
- PHIL 682 PRO-SEMINAR 3.** (6) A series of seminars on selected topics designed to provide professional training to graduate students. Topics will be selected from the general area of Metaphysics/Epistemology.
- **PHIL 683 PRO-SEMINAR 4.** (6)
- PHIL 685 FUNDAMENTALS OF LOGIC.** (3) A course in intermediate logic for graduate students in Philosophy, covering such topics as axiomatic systems, formal semantics, consistency, completeness, the limitative results, intuitionistic logic, formal theories of truth, aspects of the development of logic.
- PHIL 690 CANDIDACY PAPER.** (3)
- PHIL 693 M.A. THESIS RESEARCH.** (5) Submission of thesis topic and detailed bibliography.
May also be available as:
PHIL 693D1, PHIL 693D2;
PHIL 693N1, PHIL 693N2.
- PHIL 694 M.A. THESIS RESEARCH 2.** (5) Detailed thesis proposal.
May also be available as:
PHIL 694D1, PHIL 694D2;
PHIL 694N1, PHIL 694N2.
- PHIL 695 M.A. THESIS RESEARCH 3.** (14) Completion of thesis.

May also be available as:

PHIL 695D1, PHIL 695D2;
PHIL 695N1, PHIL 695N2.

PHIL 696 M.A. THESIS SEMINAR 1. (1) Attendance at graduate students' presentations.

PHIL 697 M.A. THESIS SEMINAR 2. (1) Attendance at graduate students' presentations.

PHIL 698 M.A. THESIS SEMINAR 3. (1) Presentation of the thesis and attendance at other thesis presentations.

● **PHIL 701 PH.D. COMPREHENSIVE EXAMINATION.** (0)

● **PHIL 701D1 PH.D. COMPREHENSIVE EXAMINATION.** (0)

● **PHIL 701D2 PH.D. COMPREHENSIVE EXAMINATION.** (0)

● **PHIL 701N1 PH.D. COMPREHENSIVE EXAMINATION.** (0)

● **PHIL 701N2 PH.D. COMPREHENSIVE EXAMINATION.** (0)

PHIL 705 GUIDED RESEARCH IN ETHICS. (3)

PHIL 706 GUIDED RESEARCH IN ETHICS. (3)

PHIL 710 GUIDED RESEARCH IN LOGIC. (3)

PHIL 711 GUIDED RESEARCH IN LOGIC. (3)

PHIL 720 GUIDED RESEARCH: PHILOSOPHY OF SCIENCE. (3)

PHIL 721 GUIDED RESEARCH: PHILOSOPHY OF SCIENCE. (3)

PHIL 730 GUIDED RESEARCH: PHILOSOPHY OF RELIGION. (3)

PHIL 731 GUIDED RESEARCH: PHILOSOPHY OF RELIGION. (3)

PHIL 740 GUIDED RESEARCH: ANCIENT PHILOSOPHY. (3)

PHIL 741 GUIDED RESEARCH: ANCIENT PHILOSOPHY. (3)

PHIL 750 GUIDED RESEARCH: MEDIEVAL PHILOSOPHY. (3)

PHIL 751 GUIDED RESEARCH: MEDIEVAL PHILOSOPHY. (3)

PHIL 760 GUIDED RESEARCH: HISTORY OF PHILOSOPHY. (3)

PHIL 761 GUIDED RESEARCH: HISTORY OF PHILOSOPHY. (3)

PHIL 770 GUIDED RESEARCH: PHILOSOPHY OF POLITICS. (3)

PHIL 771 GUIDED RESEARCH: PHILOSOPHY OF POLITICS. (3)

PHIL 780 GUIDED RESEARCH: EPISTEMOLOGY/METAPHYSICS. (3)

PHIL 781 GUIDED RESEARCH: EPISTEMOLOGY/METAPHYSICS. (3)

Several courses primarily philosophical in content are available in other departments. Note in particular the offerings in Classics, Jewish Studies, Islamic Institute, and Political Science.

62 Physical and Occupational Therapy

School of Physical and Occupational Therapy
3654 Promenade Sir-William-Osler
Montreal, QC H3G 1Y5
Canada

Telephone: (514) 398-4504

Fax: (514) 398-6360

Website: <http://www.medserv.mcgill.ca/spot/>

Director — Robert W. Dykes

Associate Director, Graduate Program — Diane St. Pierre

62.1 Staff

Professors

Hugues Barbeau; B.Sc.(P.T.), M.Sc., Ph.D.(Laval)

Robert W. Dykes; B.A.(UCLA), Ph.D.(Johns H.)

Erika Gisel; B.A.(Zur.), B.S.O.T., M.S., Ph.D.(Temple)

Sharon Wood-Dauphinee; B.Sc.(P.T.), Dip.Ed., M.Sc.A., Ph.D.(McG.)

Associate Professors

Edith P. Aston-McCrimmon; B.Sc.(P.&O.T.), Dip.Ed., M.Sc.A.(McG.)

Katherine Berg; B.P.T., B.Sc. P.T., M.Sc.(Rehab Sc.), Ph.D.(McG.)

Joyce Fung; B.Sc.(P.T.)(Hong Kong Polytech. U), Ph.D.(McG.)

Eva Kehayia; B.A., M.A., Ph.D.(McG.)

Nicol Korner-Bitensky; B.Sc.(O.T.), M.Sc., Ph.D.(McG.)
 Annette Majnemer; B.Sc.(O.T.), M.Sc., Ph.D.(McG.)
 Nancy Mayo; B.Sc.(P.T.)(Queen's), M.Sc., Ph.D.(McG.) (*James McGill Professor*)
 Patricia McKinley; B.A., M.A., Ph.D.(U.C.L.A.)
 Diane St. Pierre; B.Sc.(P.T.)(McG.), M.Sc., Ph.D.(Montr.)
Assistant Professors
 Sophie De Serres; B.Eng., M.Eng.(Ecole Polytech.), Ph.D.(Alta.)
 Sandra Everitt; B.Sc.(O.T.), M.A.(McG.)
 Isabelle Gélinas; B.Sc.(O.T.)(Montr.), M.Sc.(Virginia), Ph.D.(Rehab.Sc.)(McG.)
 Bernadette Nedelec; B.Sc.(O.T.), Ph.D.(Alta.)
 Nicole Paquet; B.Sc.(P.T.), M.Sc.(Laval), Ph.D.(McG.)
 Laurie Snider; B.Sc.(O.T.)(McG.), M.A.(Br.Col.), Ph.D.(Tor.)

62.2 Programs Offered

Master of Science (Applied) in Rehabilitation Science

A two-year program in Rehabilitation Science (Applied) is available to graduates who hold a B.Sc. or equivalent in Physical or Occupational Therapy or related health professions. Two years of clinical experience is recommended when applying for the M.Sc. (Applied). The program consists of required and elective course work and a research project.

Master of Science in Rehabilitation Science

The full curriculum consists of approximately two years of study for graduates who hold a B.Sc. degree in one of the medical rehabilitation disciplines or a related field. The program consists of required and elective course work and a research thesis.

Doctorate in Rehabilitation Science

The Ph.D. program curriculum consists of three to four years of study, on average, for graduates with Master's level training in one of the medical rehabilitation disciplines or a related field. The program consists of required and elective course work, a comprehensive written examination, a research proposal and a doctoral thesis.

62.3 Admission Requirements

Master of Science in Rehabilitation Science

1. A B.Sc. degree or equivalent in physical or occupational therapy or related fields from a university of recognized reputation.
2. Evidence of a high academic achievement equivalent to a B standing, or a McGill CGPA of 3.0 (70-74%).
3. Prerequisite courses may be required in statistics, anatomy, physiology, psychology, sociology, neurophysiology or other areas, depending on the student's anticipated specialization.
4. Non-Canadian applicants whose mother tongue is not English and who have not completed an undergraduate degree using the English language are required to submit documented proof of competency in oral and written English, by appropriate exams, e.g. TOEFL. (Test of English as a Foreign Language) with a minimum score of 250 on the computer-based test (School requirement), or the International English Language Testing System (IELTS) with a minimum overall band score of 7.0.
5. The GRE Test is mandatory for the following applicants: those who do not have a B.Sc. or equivalent from a Canadian university; those who have been out of university for 5 years or more. Only the General Test is mandatory. For consideration, students must obtain a minimum score of 550 in each category. For enquiries about Graduate Records Examination, please contact GRE - Educational Testing Service, Princeton, NJ 08540, (609) 683-2002, <http://www.gre.org/>. Applicants are responsible for ensuring that their scores are sent to the School of Physical and Occupational Therapy.

Master of Science, Applied in Rehabilitation Science

1. to 5. as above, plus
6. Two years of clinical experience is recommended.

Doctorate in Rehabilitation Science

1. An M.Sc. degree in a rehabilitation-related discipline from a university of recognized reputation.
2. Evidence of a high academic achievement equivalent to a B⁺ standing, or a McGill CGPA of 3.3 (75-79%) is required.
3. Proof of proficiency in English.
4. GRE Test with a minimum score of 600 in each category. The test is mandatory for the following applicants: those who do not have a B.Sc., M.Sc. or equivalent from a Canadian university; those who have been out of university for 5 years or more.

If a graduate student accepted into the M.Sc. program demonstrates superior performance in the first year, the Graduate Committee, in consultation with the thesis supervisor, may recommend waiving the M.Sc. thesis requirement, and allow the student to proceed directly to the Ph.D. program.

62.4 Application Procedures

Application forms for admission to graduate studies for the degree of M.Sc., M.Sc.A., or Ph.D. in Rehabilitation Science may be requested directly from the School, or downloaded from <http://www.medicine.mcgill.ca/spot/>. An on-line application is available at <http://www.mcgill.ca/applying/graduate>.

Applications will be considered upon receipt of:

1. the completed application form (on-line or paper),
2. \$60 application fee,
3. a complete curriculum vitae,
4. a statement of purpose,
5. two copies of official transcripts,
6. two letters of reference,
6. test results (GRE, TOEFL), if required.

Deadline: March 1.

Documents are to be mailed directly to the Associate Director, Graduate Program, School of Physical and Occupational Therapy

62.5 Program Requirements

Elective Courses (for all programs)

In addition to courses offered by the School of Physical and Occupational Therapy, students may choose courses given in other units. A complete list of suitable electives can be obtained from the Graduate Program Coordinator.

MASTER OF SCIENCE IN REHABILITATION SCIENCE (45 credits)

The program requires a minimum of three terms of full-time residence study. It is not uncommon for a student to take two or more years to complete the degree.

Required Courses (10 credits)

POTH 610	(3)	Research Methodology
POTH 614	(3)	Selected Topics in Rehabilitation Science
POTH 616D1	(.5)	Seminars in Rehabilitation Science
POTH 616D2	(.5)	Seminars in Rehabilitation Science
POTH 631	(3)	Research Proposal

A research proposal is to be submitted in written form and defended in front of a supervisory committee. Research proposals should be completed by the beginning of the second full-time year.

Complementary Course (3 credits)

One 3-credit graduate level course in statistics may be required if not already completed in a prior degree.

Elective Courses (3 - 6 credits)

Courses which pertain to the student's area of specialization.

Thesis Component – Required (29 credits)

POTH 696	(2)	Thesis Research
POTH 697	(6)	Thesis Research
POTH 698	(9)	Thesis Research
POTH 699	(12)	Thesis Research

The student carries out a research study in an approved subject area under the guidance of an internal supervisor (from within the

School) or an external supervisor (from outside the School). In the case of an external supervisor, an internal co-supervisor must be appointed.

All four of these courses must be registered for within the first three terms of full-time study. The course POTH 699 is carried as IP "in progress" until completion of thesis.

MASTER OF SCIENCE, APPLIED IN REHABILITATION SCIENCE (45 credits)

This program combines course work with a small research project. The residency requirement is fulfilled when all course requirements are completed. The program normally takes 3 to 4 terms when done on a full-time basis.

Required Courses (10 credits)

POTH 603	(3)	Directed Practicum
POTH 610	(3)	Research Methodology
POTH 614	(3)	Selected Topics in Rehabilitation Science
POTH 616D1	(.5)	Seminars in Rehabilitation Science
POTH 616D2	(.5)	Seminars in Rehabilitation Science

Complementary Course (6 credits)

one of:

POTH 602	(3)	Educational Methodology
EDPH 689	(3)	Teaching & Learning in Higher Education

One 3-credit graduate-level course in statistics may be required if not already completed in a prior degree.

Elective Courses (15 -18 credits)

Courses at the 500 and 600 level, related to the student's area of specialization; one or two 300 and 400-level courses may also be included upon approval of the Associate Director.

Project Component – Required (14 credits)

POTH 661	(6)	Research Project 1
POTH 662	(8)	Research Project 2

DOCTORATE IN REHABILITATION SCIENCE

Doctoral students are required to pursue at least three years of full-time residence study.

The curriculum is divided as follows:

Required Courses (12 credits)

POTH 610*	(3)	Research Methodology
POTH 614*	(3)	Selected Topics in Rehabilitation Science
POTH 620	(3)	Measurement in Rehabilitation 1
POTH 630	(3)	Measurement in Rehabilitation 2

Of the four required courses, at least two* will already have been completed by students with an M.Sc. in Rehabilitation Science from McGill.

Complementary Course (6 credits)

one of:

POTH 602	(3)	Educational Methodology
EDPH 689	(3)	Teaching & Learning in Higher Education

One 3-credit graduate-level course in statistics may be required if not already completed in a prior degree.

Elective Courses (3-6 credits)

Courses which pertain to the student's area of specialization; chosen by the student in consultation with his/her supervisor and upon approval of the Associate Director of the Graduate Program.

Comprehensive Examination

POTH 701 Ph.D. Comprehensive Examination

The student must successfully pass a written comprehensive examination by the end of the first academic year. The format is three questions to be answered in essay style over a five-day period. An additional requirement may include an oral component.

Research Proposal

A research proposal is to be submitted in written form and defended in front of a supervisory committee. Research proposals should be completed during the second full-time year, following the comprehensive examination.

Thesis Component - Required

The student carries out a research study in an approved subject area under the guidance of an internal supervisor (from within the School) or an external supervisor (from outside the School). In the case of an external supervisor, an internal co-supervisor must be appointed.

62.6 Courses

For the term (Fall and/or Winter), days, and times when courses will be offered, please refer to the 2002-2003 Class Schedule on the Web, <http://www.mcgill.ca/minerva-students/class/>. Class locations and names of instructors are also provided.

Students preparing to register are advised to consult the Class Schedule website for the most up-to-date list of courses available. New courses may have been added or courses rescheduled after this Calendar went to press.

The schedule of courses to be offered in Summer 2003, will be available on the website in January 2003.

POTH has replaced the course prefix 582.

The course credit weight is given in parentheses after the title.

● Denotes courses not offered in 2002-03

● POTH 505 DESIGNING CLINICAL INSTRUCTION. (3)

POTH 508 PLASTICITY IN REHABILITATION. (3) (Prerequisite: POTH 455 or equivalent.) A seminar course designed to provide students with a review of current research on plasticity in the central and peripheral nervous systems. Particular emphasis is placed on the mechanisms involved in the recovery of function after injury.

● **POTH 602 EDUCATIONAL METHODOLOGY.** (3) (Course equivalent: EDPH 689.)

POTH 603 DIRECTED PRACTICUM. (3) A tutorial with directed practical experience in a clinical setting related to the student's clinical specialization, including curriculum development, and emphasizing current thought in rehabilitation.

POTH 604 CURRENT TOPICS IN PEDIATRICS. (3) (Prerequisite: POTH 260, or permission of instructors.) This course will provide an overview of current research in pediatrics.

POTH 610 RESEARCH METHODOLOGY. (3) (Prerequisite: PSYC 305 or EPIB 607, or EDPE 675 and EDPE 676, or equivalent) An advanced lecture and seminar course. The philosophy of scientific inquiry, principles of research design, and application of statistical techniques are discussed with special consideration given to research studies in health care and rehabilitation.

POTH 614 SELECTED TOPICS IN REHABILITATION SCIENCE. (3) A weekly lecture and seminar course taught by staff, designed to provide an overview of current research issues in rehabilitation.

POTH 616D1 SEMINARS IN REHABILITATION SCIENCE. (0.5) (Students must also register for POTH 616D2) (No credit will be given for this course unless both POTH 616D1 and POTH 616D2 are successfully completed in consecutive terms) A weekly seminar course given by staff and invited speakers in different areas of research related to rehabilitation science. Students are expected to participate by reading pertinent literature prior to seminars and asking questions at each seminar. Attendance is compulsory, and the course is graded pass/fail based on participation.

POTH 616D2 SEMINARS IN REHABILITATION SCIENCE. (0.5) (Prerequisite: POTH 616D1) (No credit will be given for this course unless both POTH 616D1 and POTH 616D2 are successfully completed in consecutive terms) See POTH 616D1 for course description.

POTH 618 TOPICS IN REHABILITATION. (3) This is a directed reading course on a topic in rehabilitation science. The student will acquire extensive knowledge in the topic of interest and understand the strengths and limitations of the current body of work in the area.

POTH 620 MEASUREMENT: REHABILITATION 1. (3) (Prerequisite: POTH 222 and permission of instructor.) Theoretical and practical basis for utilization of electronic equipment for quantitative meas-

urement in rehabilitation research. Ambulatory assistive devices, electronic plates and instrumentation to assess normal and pathological human movement will be used to demonstrate the application of theory and techniques for quantitative analysis of human performance. Recording, reduction and analysis of electromyographic, kinetic and kinematic data included.

● **POTH 622 PATHOKINESIOLOGY.** (3) (Prerequisite: POTH 620)

POTH 630 MEASUREMENT: REHABILITATION 2. (3) (Prerequisite: EPIB 607 or PSYC 305 or equivalent.) Theoretical and practical basis for measurement in rehabilitation research. Introduction to measurement theory, scale development and related statistics, approaches and instruments used to assess outcomes in patients with musculoskeletal, neurological, cardiovascular, respiratory, psychiatric or psychologic conditions.

POTH 631 RESEARCH PROPOSAL. (3) The course covers issues involved in the development of a research protocol. The presentation of a written thesis proposal is required by the end of the course. This document will serve as the basis for an oral presentation to the student's Supervisory Committee which will also review the written proposal.

POTH 661 RESEARCH PROJECT 1. (6)

POTH 662 RESEARCH PROJECT 2. (8)

POTH 696 THESIS RESEARCH. (2)

POTH 697 THESIS RESEARCH 1. (6)

POTH 698 THESIS RESEARCH 2. (9)

POTH 699 THESIS RESEARCH 3. (12)

POTH 701 Ph.D. COMPREHENSIVE. (0)

63 Physics

Department of Physics
Ernest Rutherford Physics Building
3600 University Street
Montreal, QC H3A, 2T8
Canada

Telephone: (514) 398-6485

Fax: (514) 398-8434

Email (General): secretariat@physics.mcgill.ca

Email (Graduate information): graduate.physics@mcgill.ca

Website: <http://www.physics.mcgill.ca>

Chair — M. Grant

Director of Graduate Studies — S.K. Mark

63.1 Staff

Emeritus Professors

M.P. Langleben; B.Sc., M.Sc., Ph.D.(McG.), F.R.S.C.

E.R. Pounder; B.Sc., Ph.D.(McG.), F.R.S.C.

D.G. Stairs; B.Sc., M.Sc.(Queen's), Ph.D.(Harv.)

P.R. Wallace; B.A., M.A., Ph.D.(Tor.), F.R.S.C.

M.J. Zuckermann; M.A., D.Phil.(Oxon.), F.R.S.C.

Post-Retirement

A.P. Contogouris; B.A.(Nat. Tech. Athens), Ph.D.(C'nell)

J.E. Crawford; B.A., M.A.(Tor.), Ph.D.(McG.)

J.K.P. Lee; B.Eng., M.Sc., Ph.D.(McG.)

D.G. Ryan; B.Sc., M.Sc.(Queen's), Ph.D.(Birm.)

Professors

J. Barrette; M.Sc., Ph.D.(Montr.)

C. Burgess; B.Sc.(Wat.), Ph.D.(Texas)

S. Das Gupta; B.Sc., M.Sc.(Calc.), Ph.D.(McM.)

N.B. DeTakacsy; B.Sc., M.Sc.(Montr.), Ph.D.(McG.)

C. Gale; B.Sc.(Ott.), M.Sc., Ph.D.(McG.)

M. Grant; B.Sc.(P.E.I.), M.Sc., Ph.D.(Tor.) (*James McGill Professor*)

H. Guo; B.Sc.(Sichuan), M.Sc., Ph.D.(Pitt.)

D. Hanna; B.Sc.(McG.), M.A., Ph.D.(Harv.)

R. Harris; B.A.(Oxon.), Ph.D.(Sus)

C.S. Lam; B.Sc.(McG.), Ph.D.(M.I.T.) (*Ernest Rutherford Professor*)

S. Lovejoy; B.Sc.(Cantab.), Ph.D.(McG.)

S.K. Mark; B.Sc., M.Sc., Ph.D.(McG.) (*William C. Macdonald Professor*)

R.B. Moore; B.Eng., M.Sc., Ph.D.(McG.)

R. Myers; B.Sc.(Wat.), M.A., Ph.D.(Prin.) (*on leave*)

P.M. Patel; B.Sc., M.Sc.(Manc.), Ph.D.(Harv.)

J.O. Strom-Olsen; B.A., M.S., Ph.D.(Cantab.)

M. Sutton; B.Sc., M.Sc., Ph.D.(Tor.)

Associate Professors

J. Cline; B.Sc.(Calif.), M.Sc., Ph.D.(Cal. Tech.)

F. Corriveau; Ph.D.(Zür.)

P. Grutter; Diploma, Ph.D.(Basel) (*William Dawson Scholar*)

V. Kaspi; B.Sc.(McG.), M.A., Ph.D.(Prin.)

K. Ragan; B.Sc.(Alta.), Ph.D.(Geneva)

D.H. Ryan; B.A., Ph.D.(Dub.)

Assistant Professors

M. Hilke; B.Sc., M.Sc., Ph.D.(Geneva)

S. Jeon; B.Sc.(Korea), M.Sc., Ph.D.(Washington)

P. Wiseman; B.Sc.(St. F.X.), Ph.D.(U. W. Ont.)

Lecturers

Z. Altounian, F. Buchinger

Associate Members

M. Mackey (Physiology); E. Podgorsak (Radiation Oncology);

D. Ronis (Chemistry)

63.2 Programs Offered

M.Sc. and Ph.D.

FIELDS OF RESEARCH

High-Energy Physics

Theoretical: The McGill high energy theorists have interests in a wide range of problems pertaining to all fundamental interactions: strong, electromagnetic, weak and gravitational. The research program extends from studies closely connected with experimental data to purely theoretical questions. Ongoing projects involve: particle phenomenology, quantum chromodynamics, electroweak baryogenesis, group theory, astroparticle physics, quantum gravity, grand unification and string theory.

Experimental High Energy Physics The experimental high energy physics group is engaged in a number of experiments at the research frontiers of the field, both in subatomic physics and in high energy astrophysics. These include:

- BaBar: The group played a major role in constructing installation and commissioning of the drift chamber. The full detector has been operational and taking data since summer 1999. The physics interests of the group center on CP violation in B-meson decays to CP eigenstates and in the determination of CKM matrix elements V_{cb} and V_{ub} .
- STACEE: Members of the group are currently constructing and installing a major air Cherenkov detector for the study of high energy gamma rays emitted by astrophysical objects such as supernova remnants and active galactic nuclei. The detector (located at Sandia National Labs in Albuquerque, New Mexico) operated and successfully observed the Crab Nebula, providing a proof-of-principle of this novel technique.
- ZEUS: A group working at the world's first electron-proton collider (HERA, at DESY, Hamburg) studies lepton-quark interactions at high energy. The physics topics of interest to the group include deep inelastic scattering (proton structure, forward jet production and low-x physics) and flavour (strange, charm) production.

Thus, graduate students at the M.Sc. and Ph.D. levels are offered a strong program of research in a challenging and rapidly advancing field. Short term Master's projects are based mainly on instrumentation or data analysis conducted on Campus, while Ph.D.

research may involve an extended stay at one of the world's major research laboratories.

Nuclear Physics

Theoretical: Transport equations for heavy ion collisions at intermediate energy; nuclear equation of state from heavy ion collisions; fragmentation at intermediate energy; electromagnetic probes in relativistic heavy ion collisions; effective lagrangians for hadronic systems at finite temperature; pion-nucleus interactions.

Experimental: Current research programs in experimental nuclear physics at McGill are focussed on two main axes:

- The study of heavy-ion reactions at relativistic energies to determine the properties of nuclear matter at high density. This program is being performed at the Brookhaven National Laboratory. McGill physicists are part of a major experiment at the new heavy-ion collider RHIC, presently under construction at BNL.
- The study of ground state properties of unstable nuclei using laser spectroscopy techniques and ion traps. This work is being carried out using the Canadian Penning trap facility at the Argonne National Laboratory and at the accelerator ISOLDE (CERN).

Furthermore, the Nuclear Physics Group has an active in-house research program that applies the ion trap and laser techniques to the detection of trace quantities of material and contaminants, and to ion spectroscopy.

Condensed-Matter Physics

Theoretical: Programs of research are in progress on the properties of dilute alloys and amorphous metals, including magnetic systems and "spin-glasses"; on nonequilibrium characteristics of quantum devices; on kinetics of pattern formation during first order phase transitions, on structured fluids and polymers, on the statistical mechanics of biological membranes and growth problems; and on interface instabilities in dendritic crystal growth. Research is being done by nonlinear analysis and large-scale computational modelling.

Experimental: Lines of research include structural, transport, Mössbauer and other magnetic properties of metallic glasses and rapidly quenched metals, and certain crystalline metal alloys. High resolution X-ray diffraction using synchrotrons to study the time evolution of non-equilibrium structures and to study thin films and buried interfaces. Scanning tunneling and atomic force microscopy.

Astrophysics

This group does research in radio and X-ray observation of neutron stars and ground-based gamma-ray astronomy. The research program in X-ray astrophysics uses various X-Ray observatories including the RXTE, Chandra and the XMM satellites. Among the scientific issues addressed in this program are the properties of young neutron stars, both pulsars and "magnetars", pulsar wind nebulae, and supernova remnants.

Nonlinear Variability in Geophysics

This group studies nonlinear dynamical processes in the atmosphere and other geophysical systems, especially those associated with turbulent, chaotic and extremely variable behaviour. Emphasis is placed on multifractal analysis and modelling as well as the development of new theories and techniques covering wide ranges of scale in time and space. Data from a variety of in situ and remotely sensed sources are used. This includes satellite data of the earth's atmosphere and surface as well as high quality precipitation data from the McGill Radar Weather Observatory.

63.3 Admission Requirements

M.Sc.

Normal requirement is a B.Sc. in Physics, or equivalent, with high standing.

Ph.D.

Normal requirement is a M.Sc. in Physics or equivalent. Candidates in good standing may have the option of transferring into this program from the M.Sc. program after one year.

63.4 Application Procedures

An application package is available upon request. It includes a brochure with a detailed description of the research activities in the Department, application forms for admission to graduate studies and information concerning requirements for the M.Sc. and Ph.D. degrees. Inquiries should be addressed to the Graduate Coordinator.

Applications will be considered upon receipt of:

1. application
2. transcripts
3. letters of reference
4. \$60 application fee
5. test results (GRE, TOEFL).

All information is to be submitted to Paula Domingues, Department of Physics.

Applications and supporting documents should be submitted by:
February 1st – international applicants,
March 15th – Canadian applicants.

Commencing with applications for entry in January 2003, McGill's on-line application form will be available to all graduate program candidates at <http://www.mcgill.ca/applying/graduate>.

Financial Assistance

Subject to the availability of funds, financial assistance will be offered to students in the form of a bursary, Teaching and Research assistantships. For new students, financial support will be offered at the time of acceptance and arrival. Forms are given and filled out on registration day.

63.5 Program Requirements

M.Sc.

Candidates must successfully complete five 3-credit courses, plus PHYS 691, PHYS 692, PHYS 690 and PHYS 690D1/PHYS 690D2 (M.Sc. Thesis), in addition to all the other normal requirements of the Graduate and Postdoctoral Studies Office. The M.Sc. program in Physics carries 48 credits in total.

Ph.D.

Candidates must successfully complete two one-semester courses and a Preliminary examination and submit a Ph.D. thesis, in addition to all the normal requirements of the Graduate and Postdoctoral Studies Office. (Courses taken as part of the M.Sc. program at McGill may be accepted as substitutes for the two required courses.) Normally one of the courses must be a 600 or 700-level course in the candidate's area of specialization.

63.6 Advanced Undergraduate and Graduate Courses

For the term (Fall and/or Winter), days, and times when courses will be offered, please refer to the 2002-2003 Class Schedule on the Web, <http://www.mcgill.ca/minerva-students/class/>. Class locations and names of instructors are also provided.

Students preparing to register are advised to consult the Class Schedule website for the most up-to-date list of courses available. New courses may have been added or courses rescheduled after this Calendar went to press.

The schedule of courses to be offered in Summer 2003, will be available on the website in January 2003.

The course credit weight is given in parentheses after the title. Term(s) offered (Fall, Winter, Summer) may appear after the credit weight to indicate when a course would normally be taught. Please check the Class Schedule to confirm this information.

NOTE: All undergraduate courses administered by the Faculty of Science (courses at the 100- to 500-level) have limited enrolment.

PHYS has replaced 198 as the prefix for Physics courses.

- Denotes courses not offered in 2002-03

PHYS 514 GENERAL RELATIVITY. (3) (Winter) (3 hours lectures) Transition from special to general relativity. Non-Euclidian geometry. The basic laws of Physics in co-variant form, Einstein's equations. Gravitational waves; neutron stars; black holes; cosmology.

PHYS 521 ASTROPHYSICS. (3) (Fall) (3 hours) A quantitative course in galactic and extragalactic astrophysics. Topics include observational techniques, stars and stellar evolution, compact objects, galaxy structure, kinematics, evolution and cosmology.

PHYS 534 NANOSCIENCE AND NANOTECHNOLOGY. (3) (Fall) Topics include scanning probe microscopy, chemical selfassembly, computer modeling, and microfabrication/micromachining.

PHYS 551 QUANTUM THEORY. (3) (Fall) (3 hours lectures) General formulation, scattering theory, WKBJ approximation, time-dependent perturbation, theory and applications, angular momentum, relativistic wave equations.

PHYS 557 NUCLEAR PHYSICS. (3) (Fall) (3 hours lectures) General nuclear properties, nucleon-nucleon interaction and scattering theory, radioactivity, nuclear models, nuclear reactions.

PHYS 558 SOLID STATE PHYSICS. (3) (Fall) (3 hours lectures) Properties of crystals, lattice vibrations and thermal properties of insulators, free electron model and band structure, semi-conductors, metals, optical properties.

PHYS 559 ADVANCED STATISTICAL MECHANICS. (3) (Fall) (3 hours lectures) Self averaging and central-limit theorem; thermodynamic fluctuations; ensemble theory; surface roughening; broken symmetry and Goldstone's theorem; phase transitions; mean-field, Landau and Ornstein-Zernicke theory; Monte Carlo method; molecular dynamics; scaling; renormalization group; epsilon expansion; non-equilibrium theory.

PHYS 562 ELECTROMAGNETIC THEORY. (3) (Winter) (3 hours lectures) (Graduate Prerequisites: U1 or U2 Honours Physics or permission of instructor.) Electrostatics, dielectrics, magnetostatics, timevarying fields, relativity, radiating systems, fields of moving charges.

PHYS 567 PARTICLE PHYSICS. (3) (Winter) (3 hours lectures) Survey of elementary particles; hadrons, leptons and hardrons' constituents (quarks). Invariance principles and conservation laws. Detectors and accelerators. Phenomenology of strong, electromagnetic and weak interactions.

PHYS 602D1 BASIC PHYSICS-H.S. TEACHER. (3) (Students must also register for PHYS 602D2) (No credit will be given for this course unless both PHYS 602D1 and PHYS 602D2 are successfully completed in consecutive terms)

PHYS 602D2 BASIC PHYSICS-H.S. TEACHER. (3) (Prerequisite: PHYS 602D1) (No credit will be given for this course unless both PHYS 602D1 and PHYS 602D2 are successfully completed in consecutive terms) See PHYS 602D1 for course description.

PHYS 606 SELECTED TOPICS: CONT. PHYSICS 1. (3)

PHYS 607 SELECTED TOPICS: CONT. PHYSICS 2. (3)

PHYS 610 ADVANCED QUANTUM MECHANICS. (3) (3 hours) Relativistic wave equations for spin-0, spin-1/2, and spin-1 particles. Review of Lagrangian and Hamiltonian formalisms for classical mechanics. Canonical, Feynman path-integral, and Schwinger external-source quantization techniques. Relativistic quantum field theories for free spin-0, spin-1/2, and spin-1 particles. Interactions, perturbation theory, and Feynman diagrams.

- **PHYS 612 ADVANCED MATHEMATICAL PHYSICS 1.** (3) (3 hours)
- **PHYS 613 ADVANCED MATHEMATICAL PHYSICS 2.** (3) (3 hours)

● **PHYS 616 MULTIFRACTALS AND TURBULANCE.** (3) (3 hours)

LIDS. (3) (3 hours) Includes some of the following topics; excitations in solids, phonons, the electron gas, superconductivity and phase transitions.

PHYS 620 EXPERIMENTAL METHODS OF SUBATOMIC PHYSICS. (3) (3 hours) Basic techniques of experimentation in nuclear and particle physics. Accelerators, beam optics, detection systems, major experiments, Monte-Carlo simulation, data acquisition and data analysis.

PHYS 634 SEMINAR IN ADVANCED MATERIALS. (3) (3 hours) A series of research-level seminars about topics of current interest in advanced materials. Topics include molecular and nanoelectronics, computational approaches to materials design and property predictions, new techniques in molecular and atomic imaging, advances in materials preparation, quantum device and quantum computing.

● **PHYS 658 ADVANCED CONDENSED MATTER.** (3) (3 hours)

PHYS 659 EXPERIMENTAL CONDENSED MATTER. (3) (3 hours) To obtain an active understanding of the principles, the possibilities and the limitations of various experimental techniques. Possible topics include vacuum and low-temperature techniques; transport, thermal, magnetization and de Haas van Alphen measurements; scattering techniques; Mossbauer spectroscopy, NMR, scanning probe microscopy, electron microscopy; surface science methods.

PHYS 671 NUCLEAR STRUCTURE. (3) (3 hours) Gross properties of nuclei, nucleon-nucleon interaction, shell model, collective model, pairing model, electromagnetic and beta decay.

PHYS 672 NUCLEAR REACTIONS. (3) (3 hours) Compound nucleus and the R-matrix theory; direct reactions; heavy ion reactions.

PHYS 673 THEORETICAL HIGH ENERGY PHYSICS. (3) (3 hours) Introduction to quantum field theory; perturbation theory and Feynman diagrams. Applications to quantum electrodynamics, quantum chromodynamics and electroweak (Weinberg-Salam) theory.

PHYS 690 M.Sc. THESIS. (24)

May also be available as:

PHYS 690D1, PHYS 690D2.

PHYS 691 THESIS PREPARATION. (3) Directed study of research papers and experimental or theoretical techniques in the student's designated area of research under the supervision of the graduate studies committee of the Department.

PHYS 692 THESIS PROJECT. (6) Independent work under the direction of the student's supervisor on a research problem in the student's designated area of research leading to a project report or seminar.

May also be available as:

PHYS 692D1, PHYS 692D2.

PHYS 700 PRELIMINARY PH.D. EXAMINATION. (0)

● **PHYS 718 SPECIAL TOPICS: SOLID STATE PHYSICS 1.** (3) (3 hours)

PHYS 719 SPECIAL TOPICS: SOLID STATE PHYSICS 2. (3) (3 hours) Specialized discussion of some current problems in solid state physics.

● **PHYS 729 SPECIAL TOPICS IN NUCLEAR PHYSICS.** (3)

● **PHYS 730 SPECIAL TOPICS: HIGH ENERGY PHYSICS 1.** (3) (3 hours)

● **PHYS 731 SPECIAL TOPICS: HIGH ENERGY PHYSICS 2.** (3) (3 hours)