



Faculty of Medicine (Graduate)
Programs, Courses and University Regulations
2012-2013

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Note: Throughout this publication, "you" refers to students newly admitted, readmitted or returning to McGill.

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1 Dean's Welcome

To Graduate Students and Postdoctoral Fellows:

I am extremely pleased to welcome you to McGill University. Our world-class scholarly community includes over 250 doctoral and master's degree programs, and is recognized for excellence across the full range of academic disciplines and professions. Graduate and Postdoctoral Studies (GPS) collaborates with the Faculties and other administrative and academic units to provide strategic leadership and vision for graduate teaching and research across the University. GPS also oversees the admission and registration of graduate students, disbursing graduate fellowships, supporting postdoctoral fellows, and facilitating the graduation process, including the examination of theses. GPS has partnered with Enrolment Services to offer streamlined services in a one-stop location at [Service Point](#).

McGill is a student-centred research institution that places singular importance upon the quality of graduate education and postdoctoral training. As Associate Provost (Graduate Education), as well as Dean of Graduate and Postdoctoral Studies, I work closely with the faculties, central administration, graduate students, professors, researchers, and postdoctoral fellows to provide a supportive, stimulating, and enriching academic environment for all graduate students and postdoctoral fellows.

McGill is ranked as one of Canada's most intensive research universities and among the world's top 25. We recognize that these successes come not only from our outstanding faculty members, but also from the quality of our graduate students and postdoctoral fellows—a community into which we are very happy to welcome you.

I invite you to join us in advancing this heritage of excellence at McGill.

Martin Kreiswirth, Ph.D.

Associate Provost (Graduate Education)

Dean, Graduate and Postdoctoral Studies

2 Graduate and Postdoctoral Studies

2.1 Administrative Officers

Administrative Officers

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Shari Baum; B.A.(C'neil), M.Sc.(Vermont), Ph.D.(Brown)

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Note: For inquiries regarding specific graduate programs, please contact the appropriate department.

2.3 General Statement Concerning Higher Degrees

Graduate and Postdoctoral Studies (GPS) oversees all programs leading to graduate diplomas, certificates, and higher degrees, with the exception of some programs in the School of Continuing Studies. It is responsible for admission policies, the supervision of graduate students' work, and for recommending to Senate those who may receive the degrees, diplomas, and certificates.

3 Important Dates 2012–2013

For all dates relating to the academic year, consult www.mcgill.ca/importantdates.

4 Graduate Studies at a Glance

4.1 Graduate and Postdoctoral Degrees Offered by Faculty

McGill University offers graduate and postdoctoral programs in the following units (organized by their administering home faculty):

Faculty of Agricultural and Environmental Sciences	Degrees Available
: <i>Agricultural Economics</i>	M.Sc.
: <i>Animal Science</i>	M.Sc., M.Sc.A., Ph.D.
: <i>Bioresource Engineering</i>	M.Sc., M.Sc.A., Ph.D., Graduate Certificate
: <i>Biotechnology</i>	M.Sc.A., Graduate Certificate
: <i>Dietetics and Human Nutrition</i>	M.Sc., M.Sc.A., Ph.D., Graduate Diploma
: <i>Food Science and Agricultural Chemistry</i>	M.Sc., Ph.D.
: <i>Natural Resource Sciences</i>	M.Sc., Ph.D.
: <i>Parasitology</i>	M.Sc., Ph.D.
: <i>Plant Science</i>	M.Sc., M.Sc.A., Ph.D., Graduate Certificate
Faculty of Arts	Degrees Available
: <i>Anthropology</i>	M.A., Ph.D.
: <i>Art History</i>	M.A., Ph.D.
Classics – see : <i>History and Classical Studies</i>	N/A
: <i>Communication Studies</i>	M.A., Ph.D.
: <i>East Asian Studies</i>	M.A., Ph.D.
: <i>Economics</i>	M.A., Ph.D.
: <i>English</i>	M.A., Ph.D.
: <i>French Language and Literature</i>	M.A., Ph.D.
: <i>Geography</i>	M.A., Ph.D.
: <i>History and Classical Studies</i>	M.A., Ph.D.
: <i>Institute for the Study of International Development</i>	N/A
: <i>Islamic Studies</i>	M.A., Ph.D.

Faculty of Arts	Degrees Available
: <i>Jewish Studies</i>	M.A.
: <i>Languages, Literatures, and Cultures</i>	M.A., Ph.D.
: <i>Linguistics</i>	M.A., Ph.D.
: <i>Mathematics and Statistics</i>	M.A., Ph.D.
: <i>Philosophy</i>	M.A., Ph.D.
: <i>Political Science</i>	M.A., Ph.D.
: <i>Psychology</i>	M.A., Ph.D.
: <i>Quebec Studies / Études sur le Québec</i>	N/A
: <i>Social Studies of Medicine</i>	N/A
: <i>Social Work</i>	M.S.W., Ph.D.
: <i>Sociology</i>	M.A., Ph.D.
School of Dentistry	Degrees Available
: <i>Dentistry</i>	M.Sc.
Desautels Faculty of Management	Degrees Available
: <i>Desautels Faculty of Management</i>	M.B.A., M.B.A. with Integrated B.C.L./LL.B., M.D./M.B.A., M.B.A./Japan, E.M.B.A., M.M.M., M.M., Ph.D., Graduate Certificate, Diploma
Faculty of Education	Degrees Available
: <i>Educational and Counselling Psychology</i>	M.A., M.Ed., Ph.D., Graduate Diploma
: <i>Information Studies</i>	M.L.I.S., Ph.D., Graduate Certificate, Graduate Diploma
: <i>Integrated Studies in Education</i>	M.A., Ph.D., Graduate Certificate
: <i>Kinesiology and Physical Education</i>	M.A., M.Sc.
Faculty of Engineering	Degrees Available
: <i>Architecture</i>	M.Arch., Ph.D.
: <i>Chemical Engineering</i>	M.Eng., Ph.D.
: <i>Civil Engineering and Applied Mechanics</i>	M.Sc., M.Eng., Ph.D.
: <i>Electrical and Computer Engineering</i>	M.Eng., Ph.D.
: <i>Mechanical Engineering</i>	M.Sc., M.Eng., Ph.D.
: <i>Mining and Materials Engineering</i>	M.Sc., M.Eng., Ph.D., Graduate Diploma
: <i>Urban Planning</i>	M.U.P.
Faculty of Law	Degrees Available
: <i>Law</i>	LL.M., D.C.L., Graduate Certificate
McGill School of Environment	Degrees Available
: <i>Environment</i>	N/A
Faculty of Medicine	Degrees Available
<i>section 11.1: Anatomy and Cell Biology</i>	M.Sc., Ph.D.
<i>section 11.2: Biochemistry</i>	M.Sc., Ph.D.
<i>section 11.3: Bioethics</i>	N/A
<i>section 11.4: Biomedical Engineering</i>	M.Eng., Ph.D.
<i>section 11.5: Communication Sciences and Disorders</i>	M.Sc., M.Sc.A., Ph.D.
<i>section 11.6: Epidemiology and Biostatistics</i>	M.Sc., Ph.D., Graduate Diploma

Faculty of Medicine	Degrees Available
<i>section 11.9: Human Genetics</i>	M.Sc., Ph.D.
<i>section 11.10: Medical Physics</i>	M.Sc.
<i>section 11.11: Medicine, Experimental</i>	M.Sc., Ph.D., Graduate Diploma
<i>section 11.12: Medicine, Family (Option)</i>	N/A
<i>section 11.13: Microbiology and Immunology</i>	M.Sc., Ph.D.
<i>section 11.14: Neuroscience (Integrated Program in)</i>	M.Sc., Ph.D.
<i>section 11.15: Occupational Health</i>	M.Sc.A., Ph.D.
<i>section 11.16: Otolaryngology – Head and Neck Surgery</i>	M.Sc.
<i>section 11.17: Pathology</i>	M.Sc., Ph.D.
<i>section 11.18: Pharmacology and Therapeutics</i>	M.Sc., Ph.D.
<i>section 11.19: Physiology</i>	M.Sc., Ph.D.
<i>section 11.20: Psychiatry</i>	M.Sc.
<i>section 11.21: Surgery, Experimental (Division of Surgical Research)</i>	M.Sc., Ph.D., Graduate Diploma
Ingram School of Nursing	Degrees Available
<i>: Nursing</i>	M.Sc.A., Ph.D., Graduate Certificate, Graduate Diploma
School of Physical and Occupational Therapy	Degrees Available
<i>: Physical and Occupational Therapy</i>	M.Sc., M.Sc.A., Ph.D., Graduate Certificate
Faculty of Religious Studies	Degrees Available
<i>: Religious Studies</i>	M.A., S.T.M., Ph.D.
Schulich School of Music	Degrees Available
<i>: Schulich School of Music</i>	M.A., M.Mus., D.Mus., Ph.D., Graduate Diploma
Faculty of Science	Degrees Available
<i>: Atmospheric and Oceanic Sciences</i>	M.Sc., Ph.D.
<i>: Biology</i>	M.Sc., Ph.D.
<i>: Chemistry</i>	M.Sc., M.Sc.A., Ph.D.
<i>: Computer Science</i>	M.Sc., Ph.D.
<i>: Earth and Planetary Sciences</i>	M.Sc., Ph.D.
<i>: Geography</i>	M.Sc., Ph.D.
<i>: Mathematics and Statistics</i>	M.Sc., Ph.D.
<i>: Physics</i>	M.Sc., Ph.D.
<i>: Psychology</i>	M.Sc., Ph.D.

4.2 Master's Degrees and Prerequisites

The following list shows all of the master's degrees available at McGill, along with their prerequisites. See [section 4.3: Master's Degree Programs and Specializations](#) for more information on specific programs and options.

Degree	Prerequisites
Master of Arts M.A.	Bachelor of Arts in the subject selected for graduate work. See appropriate unit.
Master of Architecture M.Arch.	Professional degree – McGill B.Sc.(Arch.) degree, or equivalent.

Degree		Prerequisites
		Post-professional degree – an M.Arch. (professional degree) or equivalent professional degree.
Master of Business Administration	M.B.A.	An undergraduate degree from an approved university. See : M.B.A. Program .
Master of Business Administration with integrated Bachelor of Civil Law / Bachelor of Laws	M.B.A. with B.C.L./LL.B.	See : M.B.A. Program .
Master of Business Administration with Doctor of Medicine / Master of Surgery	M.B.A. with M.D.,C.M.	See : M.B.A. Program .
Master of Education	M.Ed.	Bachelor's degree with specialization related to the subject chosen for graduate work, plus a Permanent Quebec Teaching Diploma or its equivalent for some of the above degrees. See appropriate department.
Master of Engineering	M.Eng.	Bachelor of Engineering or equivalent, with specialization appropriate for the subject selected for graduate study. See appropriate department.
Master of Laws	LL.M.	An acceptable degree in Law or equivalent qualifications. See : Law Admission Requirements and Application Procedures .
Master of Library and Information Studies	M.L.I.S.	At least a bachelor's degree from a recognized university. See : Information Studies Admission Requirements and Application Procedures .
Master of Management	M.M.	See : Master of Management Programs Admission Requirements and Application Procedures .
Master of Manufacturing Management	M.M.M.	See : Master of Management Programs Admission Requirements and Application Procedures .
Master of Music	M.Mus.	Bachelor of Music or Bachelor of Arts with concentration in the area selected for graduate study. Applicants to the Performance program are required to pass auditions in their speciality. See : Schulich School of Music .
Master of Sacred Theology	S.T.M.	B.A. with specialization in religious studies or theology. See : Religious Studies Admission Requirements and Application Procedures .
Master of Science	M.Sc.	Bachelor of Science in the subject selected for graduate work. See appropriate unit.
Master of Science, Applied	M.Sc.A.	A bachelor's degree in the subject selected for graduate work. See appropriate unit.
Master of Social Work	M.S.W.	Bachelor's degree in Social Work including courses in statistics and social science research methods. See : Social Work Admission Requirements and Application Procedures .
Master of Social Work with Bachelor of Civil Law and Bachelor of Laws	M.S.W. with B.C.L. and LL.B.	See : Social Work Admission Requirements and Application Procedures .
Master of Urban Planning	M.U.P.	Bachelor's degree in any one of the following: Anthropology, Architecture, Economics, Civil Engineering, Geography, Law, Management, Political Science, Social Work, Sociology, or Urban Planning, with adequate knowledge of quantitative techniques. See : Urban Planning Admission Requirements and Application Procedures .

4.3 Master's Degree Programs and Specializations

The following list shows all of the programs and options available for each degree at McGill.

Master of Architecture (M.Arch.)

Program	Thesis/Non-Thesis	Options
Professional	Non-Thesis	Design Studio, Design Studio – Directed Research

Program	Thesis/Non-Thesis	Options
Post-professional	Non-Thesis	Architectural History and Theory, Cultural Mediations and Technology, Urban Design and Housing

Master of Arts (M.A.)

Programs leading to the degree of Master of Arts are offered in the following areas:

Program Areas	Thesis/Non-Thesis	Options
Anthropology	Thesis, Non-Thesis	Development Studies, Environment, Gender and Women's Studies (Thesis)
Art History	Non-Thesis	Gender and Women's Studies (Non-Thesis)
Classics	Thesis, Non-Thesis	N/A
Communication Studies	Thesis, Non-Thesis	Gender and Women's Studies (Thesis)
Counselling Psychology	Non-Thesis (Professional Internship), Non-Thesis (Project)	N/A
East Asian Studies	Thesis (<i>Ad Hoc</i>)	N/A
Economics	Thesis, Non-Thesis	Development Studies, Social Statistics (Non-Thesis)
Educational Psychology	Thesis	N/A
Education and Society	Thesis, Non-Thesis	Gender and Women's Studies (Thesis) Gender and Women's Studies, Jewish Education (Non-Thesis)
Educational Leadership	Thesis, Non-Thesis (Coursework), Non-Thesis (Project)	Gender and Women's Studies (Thesis) Gender and Women's Studies (Non-Thesis (Project))
English	Thesis, Non-Thesis	N/A
French	Thesis, Non-Thesis	Gender and Women's Studies (Thesis)
Geography	Thesis	Development Studies, Environment, Gender and Women's Studies, Neotropical Environment, Social Statistics (Thesis)
German	Thesis, Non-Thesis	N/A
Hispanic Studies	Thesis, Non-Thesis	N/A
History	Thesis, Non-Thesis	Development Studies, European Studies, Gender and Women's Studies (Thesis) Development Studies, European Studies, Gender and Women's Studies (Non-Thesis)
History of Medicine	Non-Thesis	N/A
Islamic Studies	Thesis	Gender and Women's Studies (Thesis)
Italian	Thesis, Non-Thesis	N/A
Jewish Studies	Thesis, Non-Thesis	N/A
Kinesiology and Physical Education	Thesis, Non-Thesis	N/A
Linguistics	Non-Thesis	N/A
Mathematics and Statistics	Thesis, Non-Thesis	N/A
Medical Anthropology	Thesis	N/A
Music – Music Education	Thesis, Non-Thesis	N/A
Music – Music Technology	Thesis, Non-Thesis	N/A
Music – Musicology	Thesis, Non-Thesis	Gender and Women's Studies (Thesis)
Music – Theory	Thesis, Non-Thesis	Gender and Women's Studies (Thesis)
Philosophy	Thesis	Bioethics

Program Areas	Thesis/Non-Thesis	Options
Political Science	Thesis, Non-Thesis	Development Studies, European Studies (Thesis) Development Studies, European Studies, Gender and Women's Studies, Social Statistics (Non-Thesis)
Psychology	Thesis	N/A
Religious Studies	Thesis, Non-Thesis	Bioethics, Gender and Women's Studies (Thesis)
Russian	Thesis	N/A
Second Language Education	Thesis, Non-Thesis	Gender and Women's Studies (Thesis)
Sociology	Thesis, Non-Thesis	Development Studies, Environment, Gender and Women's Studies, Medical Sociology, Neotropical Environment (Thesis) Development Studies, Gender and Women's Studies, Medical Sociology, Social Statistics (Non-Thesis)
Teaching and Learning	Non-Thesis	English or French Second Language, English Language Arts, Mathematics, Science and Technology, Social Sciences

Master of Business Administration and Management Degrees (M.B.A., M.M., M.M.M.)

A program leading to the degree of Master of Business Administration (M.B.A.) is offered in the following concentrations:

Program	Thesis/Non-Thesis	Options
M.B.A.	Non-Thesis	Finance, General Management, Global Strategy and Leadership, Marketing, Technology and Innovation (Non-Thesis)
M.B.A. with B.C.L. and LL.B.	Non-Thesis	Finance, General Management, Global Strategy and Leadership, Marketing, Technology and Innovation (Non-Thesis)
M.D./M.B.A.	Non-Thesis	N/A
M.B.A./Japan	Non-Thesis	Finance, General Management, Global Strategy and Leadership, Marketing, Technology and Innovation (Non-Thesis)
E.M.B.A.	Non-Thesis	N/A
M.M.M.	Non-Thesis	N/A
M.M./IMPM	Non-Thesis	N/A
M.M./IMPMHL	Non-Thesis	N/A

Master of Education (M.Ed.)

Program	Thesis/Non-Thesis	Options
Educational Psychology	Non-Thesis	N/A

Master of Engineering (M.Eng.)

Program	Thesis/Non-Thesis	Options
Aerospace Engineering	Non-Thesis	N/A
Biomedical Engineering	Thesis, Non-Thesis	Bioinformatics (Thesis)
Chemical Engineering	Non-Thesis	Environmental Engineering (Non-Thesis)
Civil Engineering	Thesis, Non-Thesis	Environmental Engineering (Non-Thesis)
Electrical Engineering	Thesis, Non-Thesis	Computational Science and Engineering (Thesis)
Mechanical Engineering	Thesis, Non-Thesis	Computational Science and Engineering (Thesis)
Mining and Materials Engineering	Thesis, Non-Thesis	Environmental Engineering (Non-Thesis)

Master of Laws (LL.M.)

Program	Thesis/Non-Thesis	Options
Law	Thesis, Non-Thesis	Bioethics, European Studies (Thesis) Air and Space Law, Environment, Comparative Law (Thesis and Non-Thesis)

Master of Library and Information Studies (M.L.I.S.)

The Graduate School of Library and Information Studies offers a postgraduate professional program in librarianship. Two years of full-time study or the equivalent are required.

Program	Thesis/Non-Thesis	Options
Information Studies	Non-Thesis	N/A

Master of Music (M.Mus.)

Program	Thesis/Non-Thesis	Options
Music – Composition	Non-Thesis	N/A
Performance	Thesis	Vocal Pedagogy, Jazz Performance, Early Music, Orchestral Instruments and Guitar, Collaborative Piano, Piano, Opera and Voice, Organ and Church Music, Conducting
Sound Recording	Non-Thesis	N/A

Master of Sacred Theology (S.T.M.)

A program leading to the degree of Sanctae Theologiae Magister (S.T.M.) is given in the Faculty of Religious Studies. This degree is primarily for those who intend to enter the ministry of the Christian Church or another religious institution, or to proceed to teaching in schools. A Master of Arts program (thesis and non-thesis) is also available.

Program	Thesis/Non-Thesis	Options
Religious Studies	Non-Thesis	N/A

Master of Science (M.Sc.)

Program Areas	Thesis/Non-Thesis	Options
Agricultural Economics	Thesis	N/A
Animal Science	Thesis	N/A
Atmospheric and Oceanic Science	Thesis	Environment (Thesis)
Biochemistry	Thesis	Bioinformatics, Chemical Biology (Thesis)
Biology	Thesis	Bioinformatics, Environment, Neotropical Environment
Bioresource Engineering	Thesis, Non-Thesis	Environment, Neotropical Environment (Thesis) Integrated Water Resource Management (Non-Thesis)
Biostatistics	Thesis, Non-Thesis	N/A
Cell Biology	Thesis	N/A
Chemistry	Thesis	Chemical Biology
Civil Engineering	Thesis	N/A
Communication Sciences and Disorders	Thesis	N/A
Computer Science	Thesis, Non-Thesis	Bioinformatics, Computational Science, Engineering (Thesis)
Dental Science	Thesis, Non-Thesis	Oral and Maxillofacial Surgery (Thesis)
Earth and Planetary Sciences	Thesis	Environment
Entomology	Thesis	Environment, Neotropical Environment
Epidemiology	Thesis	N/A
Experimental Medicine	Thesis	Bioethics, Environment, Family Medicine
Experimental Surgery	Thesis	Surgical Research

Program Areas	Thesis/Non-Thesis	Options
Food Science and Agricultural Chemistry	Thesis, Non-Thesis	Food Safety (Non-Thesis)
Genetic Counselling	Non-Thesis	N/A
Geography	Thesis	Environment, Neotropical Environment
Human Genetics	Thesis	Bioethics, Bioinformatics
Human Nutrition	Thesis	N/A
Kinesiology and Physical Education	Thesis, Non-Thesis	N/A
Mathematics and Statistics	Thesis, Non-Thesis	Bioinformatics, Computational Science and Engineering
Mechanical Engineering	Thesis	N/A
Medical Radiation Physics	Thesis	N/A
Microbiology	Thesis	Environment
Microbiology and Immunology	Thesis	N/A
Mining and Materials Engineering	Thesis	N/A
Neuroscience	Thesis	N/A
Otolaryngology	Thesis	N/A
Parasitology	Thesis	Bioinformatics, Environment
Pathology	Thesis	N/A
Pharmacology	Thesis	Chemical Biology
Physics	Thesis	N/A
Physiology	Thesis	Bioinformatics
Plant Science	Thesis	Bioinformatics, Environment, Neotropical Environment
Psychiatry	Thesis	N/A
Psychology	Thesis	N/A
Public Health	Non-Thesis	Environment
Rehabilitation Sciences	Thesis, Non-Thesis	N/A
Renewable Resources	Thesis, Non-Thesis	Environment, Neotropical Environment (Thesis) Environmental Assessment (Non-Thesis)

Master of Science, Applied (M.Sc.A.)

This degree was designed to provide postgraduate training of a professional and vocational character, with less emphasis on theoretical knowledge and research than in Master of Science programs, but with no lower standards either for admission or completion of requirements. Two years of full-time study or equivalent are normally required with an emphasis on coursework.

Program	Thesis/Non-Thesis	Options
Animal Science	Non-Thesis	N/A
Bioresource Engineering	Non-Thesis	Environment, Environmental Engineering, Neotropical Environment
Biotechnology	Non-Thesis	N/A
Chemistry	Non-Thesis	N/A
Communication Sciences and Disorders	Non-Thesis	Speech-Language Pathology
Human Nutrition	Non-Thesis (Project), Non-Thesis (Practicum)	N/A
Nursing	Non-Thesis	N/A
Occupational Health	Non-Thesis (Resident), Non-Thesis (Distance)	N/A

Program	Thesis/Non-Thesis	Options
Occupational Therapy	Non-Thesis	N/A
Physical Therapy	Non-Thesis	N/A
Plant Science	Non-Thesis	N/A

Master of Social Work (M.S.W.)

The M.S.W. degree represents a second level of professional study in which students build competence in a chosen field of practice.

Program	Thesis/Non-Thesis	Options
Social Work	Thesis, Non-Thesis	N/A
Joint Master of Social Work with B.C.L. and LL.B.	Non-Thesis	N/A

Master of Urban Planning

The program requires a minimum of two years residence and a three-month internship with a member of a recognized planning association.

Program	Thesis/Non-Thesis	Options
Urban Planning	Thesis, Non-Thesis	Transportation Planning, Urban Design (Non-Thesis)

4.4 Doctoral Degrees

The following section lists the doctoral degrees available at McGill, along with their prerequisites. See [section 4.4.1: Doctoral Degree Programs and Specializations](#) for specific programs and options for doctoral degrees.

Degree		Prerequisites
Doctor of Civil Law	D.C.L.	B.C.L. or LL.B. and usually LL.M. See Law.
Doctor of Music	D.Mus.	M.A. in Composition (D.Mus. in Composition) or a master's degree in Performance, and professional and teaching experience (D.Mus. in Performance). See Music.
Doctor of Philosophy	Ph.D.	An undergraduate degree relevant to the subject chosen for graduate work. Some departments require all Ph.D. candidates to hold a master's degree in the same subject. Departments may recommend that candidates of undoubted promise should be allowed to proceed directly to the Ph.D. degree without being required to submit a master's thesis.

4.4.1 Doctoral Degree Programs and Specializations**Doctor of Civil Law (D.C.L.)**

Doctoral programs are offered in Air and Space Law and Law (Comparative Law). Both are predominantly research degrees awarded on the basis of a thesis that represents an original contribution to the development of legal science.

Program	Options	Offered by Faculty/School
Law	Air and Space Law, Comparative Law	Faculty of Law

Doctor of Music (D.Mus.)

The Doctor of Music degree is offered in Composition. The Doctoral thesis consists of a musical composition of major dimensions together with a written analysis of the work. The composition is presented by the candidate in concert. The regulations set forth for the Ph.D. generally apply also to the D.Mus.

The Doctor of Music degree is also offered in Performance. It is offered to professional musicians who wish to teach at the university level and to develop a specialization in a particular repertoire, approach, or discipline (musicology, music theory, music education and pedagogy, or music technology).

Program	Options	Offered by Faculty/School
Music	Composition, Performance Studies	Schulich School of Music

Doctor of Philosophy Degrees

Programs leading to the degree of Doctor of Philosophy are offered in the following areas:

Program	Options	Offered by Faculty/School
Animal Science	Bioinformatics	Faculty of Agricultural and Environmental Sciences
Anthropology	Neotropical Environment	Faculty of Arts
Architecture	N/A	Faculty of Engineering
Art History	Gender and Women's Studies	Faculty of Arts
Atmospheric and Oceanic Sciences	N/A	Faculty of Science
Biochemistry	Bioinformatics, Chemical Biology	Faculty of Medicine
Biology	Bioinformatics, Developmental Biology, Environment, Neotropical Environment	Faculty of Science
Biomedical Engineering	Bioinformatics	Faculty of Medicine
Bioresource Engineering	Environment, Neotropical Environment	Faculty of Agricultural and Environmental Sciences
Biostatistics	N/A	Faculty of Medicine
Cell Biology	N/A	Faculty of Medicine
Chemical Engineering	N/A	Faculty of Engineering
Chemistry	Chemical Biology	Faculty of Science
Civil Engineering	N/A	Faculty of Engineering
Classics	N/A	Faculty of Arts
Communication Sciences and Disorders	Language Acquisition	Faculty of Medicine
Communication Studies	Gender and Women's Studies	Faculty of Arts
Computer Science	Bioinformatics	Faculty of Science
Counselling Psychology	N/A	Faculty of Education
Earth and Planetary Sciences	Environment	Faculty of Science
Economics	N/A	Faculty of Arts
Educational Psychology	N/A	Faculty of Education
Educational Studies	Gender and Women's Studies, Language Acquisition	Faculty of Education
Electrical Engineering	N/A	Faculty of Engineering
English	N/A	Faculty of Arts
Entomology	Environment, Neotropical Environment	Faculty of Agricultural and Environmental Sciences
Epidemiology	N/A	Faculty of Medicine
Experimental Medicine	Environment	Faculty of Medicine
Experimental Surgery (Surgical Research)	N/A	Faculty of Medicine
Food Science and Agricultural Chemistry	N/A	Faculty of Agricultural and Environmental Sciences
French Language and Literature	Gender and Women's Studies	Faculty of Arts
Geography	Environment, Gender and Women's Studies, Neotropical Environment	Faculty of Arts, Faculty of Science
German	N/A	Faculty of Arts
Hispanic Studies	N/A	Faculty of Arts
History	N/A	Faculty of Arts
Human Genetics	Bioinformatics	Faculty of Medicine
Human Nutrition	N/A	Faculty of Agricultural and Environmental Sciences
Information Studies	N/A	Faculty of Education

Program	Options	Offered by Faculty/School
Islamic Studies	Gender and Women's Studies	Faculty of Arts
Linguistics	Language Acquisition	Faculty of Arts
Management	N/A	Desautels Faculty of Management
Mathematics and Statistics	Bioinformatics	Faculty of Arts, Faculty of Science
Mechanical Engineering	N/A	Faculty of Engineering
Microbiology	N/A	Faculty of Agricultural and Environmental Sciences
Microbiology and Immunology	Bioinformatics, Environment	Faculty of Medicine
Mining and Materials Engineering	N/A	Faculty of Engineering
Music	(Composition, Music Education, Musicology, Music Technology, Sound Recording, Theory), Gender and Women's Studies	Schulich School of Music
Neuroscience	N/A	Faculty of Medicine
Nursing	Psychosocial Oncology	Ingram School of Nursing
Occupational Health	N/A	Faculty of Medicine
Parasitology	Bioinformatics, Environment	Faculty of Agricultural and Environmental Sciences
Pathology	N/A	Faculty of Medicine
Pharmacology	Chemical Biology	Faculty of Medicine
Philosophy	Environment, Gender and Women's Studies	Faculty of Arts
Physics	N/A	Faculty of Science
Physiology	Bioinformatics	Faculty of Medicine
Plant Science	Bioinformatics, Environment, Neotropical Environment	Faculty of Agricultural and Environmental Sciences
Political Science	Gender and Women's Studies	Faculty of Arts
Psychology	Language Acquisition, Psychosocial Oncology	Faculty of Arts, Faculty of Science
Rehabilitation Science	N/A	School of Physical and Occupational Therapy
Religious Studies	Gender and Women's Studies	Faculty of Religious Studies
Renewable Resources	Environment, Neotropical Environment	Faculty of Agricultural and Environmental Sciences
Russian	N/A	Faculty of Arts
School/Applied Child Psychology	N/A	Faculty of Education
Social Work	N/A	Faculty of Arts
Sociology	Environment, Gender and Women's Studies	Faculty of Arts

Joint Doctor of Philosophy Degrees

The following joint Ph.D. programs are offered:

- Nursing (McGill / Université de Montréal)
- Management (McGill / Concordia / H.E.C. / UQAM)
- Social Work (McGill / Université de Montréal)

Ad Hoc Doctor of Philosophy Degrees (Ph.D. (Ad Hoc))

Several departments offer the possibility of directly entering a Ph.D. program on an *ad hoc* basis, or, with the permission of the supervisor and the approval of the Graduate Program Director, exceptional students may transfer from the master's program to the *ad hoc* Ph.D. program.

Program	Options	Offered by Faculty/School
East Asian Studies	N/A	Faculty of Arts
Italian Studies	N/A	Faculty of Arts
Kinesiology and Physical Education	N/A	Faculty of Education

Program	Options	Offered by Faculty/School
Psychiatry	N/A	Faculty of Medicine
Urban Planning	N/A	Faculty of Engineering

4.5 Postdoctoral Research

See [section 8: Postdoctoral Research](#) for information about postdoctoral research at McGill University.

4.6 Graduate Diplomas and Graduate Certificates

The graduate diplomas and graduate certificates listed below are programs of study under the academic supervision of Graduate and Postdoctoral Studies. The prerequisite for a diploma or certificate is an undergraduate degree in the same discipline.

Graduate Diplomas are offered in:

Clinical Research	Professional Performance
Epidemiology	Public Accountancy (Chartered Accountancy)
Library and Information Studies	Registered Dietician Credentialing (R.D.)
Mining Engineering	School/Applied Child Psychology (Post-Ph.D.)
Neonatal Nurse Practitioner	Surgical Health Care Research
Primary Care Nurse Practitioner	

These diploma programs consist of at least two terms of full-time study or the equivalent.

Graduate Certificates are offered in:

Assessing Driving Capabilities	Educational Leadership 1
Air and Space Law	Educational Leadership 2
Bioinformatics	Library and Information Studies
Bioresource Engineering (Integrated Water Resources Management)	Post-M.B.A.
Biotechnology	Teaching English as a Second Language
Chronic Pain Management	Theory in Primary Care
Comparative Law	Theory in Neonatology

All graduate regulations apply to graduate diploma and graduate certificate candidates.



Note: The School of Continuing Studies offers graduate diplomas and graduate certificates that are not under the academic supervision of Graduate and Postdoctoral Studies. To see a list of the programs offered refer to the School of Continuing Studies *Programs, Courses and University Regulations* publication available at www.mcgill.ca/study.

5 Program Requirements

5.1 Master's Degrees

Residence Requirements – Master's Degrees

Refers to the number of terms (or years) students must be registered on a full-time basis to complete their program. Students are NOT permitted to graduate until they have fulfilled the residence requirement (or paid the corresponding fees) in their program.

- The following master's programs have a minimum residence requirement of **three full-time terms**: M.Arch, M.A., M.Eng., LL.M., M.Mus. (**except** M.Mus. in Sound Recording), M.Sc., M.S.W., M.Sc.A. (**except** M.Sc.A. in Communication Sciences and Disorders).
- The following master's programs have a **minimum** residence requirement of **four full-time terms**: M.L.I.S.; M.Mus. in Sound Recording; M.U.P.; M.A. (60 credits – Counselling Psychology – thesis; 78 credits – Educational Psychology); M.A. Teaching and Learning – Non-Thesis; M.Sc.A. in Communication Sciences and Disorders; S.T.M., Religious Studies.
- The residence requirement for the master's program in Education (M.Ed.); Library and Information Studies (M.L.I.S.); Management (M.B.A.); Religious Studies (S.T.M.); M.A. Counselling Psychology – Non-Thesis; M.A. Teaching and Learning – Non-Thesis; M.Sc. in Public Health – Non-Thesis; M.Sc.A. Nursing; M.Sc.A. Occupational Therapy; M.Sc.A. Physical Therapy; and students in part-time programs is determined on a per course basis. Residence requirements are fulfilled when students complete all course requirements in their respective programs.
- For master's programs structured as Course, Project or Non-Thesis options where the program is pursued on a part-time basis, residence requirements are normally fulfilled when students complete all course requirements in their respective programs (minimum 45 credits or a minimum of three full-time terms) and pay the fees accordingly.

These designated periods of residence represent minimum time requirements. There is no guarantee that the work for the degree can be completed in this time. Students must register for such additional terms as are needed to complete the program.

Coursework – Master's Degrees

Program requirements are outlined in the relevant departmental sections of the Graduate and Postdoctoral Studies *Programs, Courses and University Regulations* publication, available at www.mcgill.ca/study.

The department concerned will examine the student's previous training and then decide which of the available courses in the area of specialization or related fields are required to bring the candidate to the proper level for the master's degree. Due account will be taken of relevant courses passed at any recognized university.

As a rule, no more than one-third of the McGill program formal coursework (not thesis, project, stage, or internship) can be credited with courses from another university.

Non-thesis degrees normally specify the course program which the candidate must follow.

The candidate is required to pass, with a grade of B- or better, all those courses that have been designated by the department as forming a part of the program, including additional requirements.

Students taking courses at another university must obtain a minimum grade of B- (65%) if the course is to be credited toward their McGill degree. In the cases where only a letter grade is used, a B- is the minimum passing grade and no equivalent percentage will be considered. In the cases where only a percentage grade is used, 65% is the minimum passing grade.

If courses were not used for a degree, they could be **credited** toward a McGill degree, keeping in mind that a maximum of one-third of the coursework (not thesis, project, stage, internship, and practicum) can be credited. If an **exemption** is granted, it must be replaced by another graduate course at McGill toward the degree. No double counting is ever allowed. This regulation also applies to doctoral programs.

Research and Thesis – Master's Degrees

All candidates for a research degree must present a thesis based on their own research. The total number of credits allotted to the thesis in any master's program must not be less than 24. The title of the thesis and names of examiners must be forwarded on a *Nomination of Examiners* form, in accordance with the dates on www.mcgill.ca/importantdates, through the chair of the department concerned at the same time as the thesis is submitted to Graduate and Postdoctoral Studies. A thesis for the master's degree, while not necessarily requiring an exhaustive review of work in the particular field of study, or a great deal of original scholarship, must show familiarity with previous work in the field and must demonstrate the ability to carry out research and to organize results, all of which must be presented in good literate style. The thesis will not normally exceed 100 pages; in some disciplines, shorter texts are preferred. Guidelines and deadlines are available at www.mcgill.ca/gps/thesis/guidelines.

Language Requirements – Master's Degrees

Most master's degree programs do not include language requirements, but candidates who intend to proceed to a doctoral degree should take note of any language requirements and are strongly advised to take the examinations in at least one language while working for the master's degree.

5.2 Doctoral Degrees

Residence Requirements – Doctoral

Refers to the numbers of terms (or years) students must be registered on a full-time basis to complete their program. Students are not permitted to graduate until they have fulfilled the residence requirement (or paid the corresponding fees) in their program.

Candidates entering Ph.D. 1 must follow a program of at least three years' residency at the University; this is a minimum requirement, and there is no guarantee that the work of the degree can be completed in this time, but students are expected to complete within the maximum specified period. Only exceptional candidates holding a bachelor's degree will be considered for direct admission to Ph.D. 1 level.

It is required that candidates spend the greater part of each summer working on their theses, and those who do not do so are unlikely to complete a satisfactory thesis in the prescribed minimum time (see [section 8.3: Vacation Policy for Graduate Students and Postdocs](#)).

A student who has obtained a master's degree at McGill University or at an approved institution, in a relevant subject and is proceeding to a Ph.D. degree will, on the recommendation of the department, be admitted to Ph.D. 2; in this case, the residency requirement for the program is two years.

In the doctoral program, students must be registered on a full-time basis for one more year after completion of the residency (i.e., Ph.D. 4 year) before continuing as Additional Session students until completion of the program.



Note: The master's degree must have been awarded before initial registration in the doctoral program; otherwise, the admission level will be at Ph.D. 1 and residency will be extended to three years. Once the level of admission is approved, it will not be changed after obtaining the master's degree if the date falls after registration in the program. If a previous awarded degree is a condition of admission, it must be fulfilled before registration in another program.

As a rule, no more than one-third of the McGill program formal coursework can be credited with courses from another university.

Comprehensive Examinations – Doctoral

A comprehensive examination or its equivalent is usually held near the end of Ph.D. 2. The results of this examination determine whether or not students will be permitted to continue in their programs. The methods adopted for examination and evaluation and the areas to be examined are specified by departmental regulations approved by the Dean of Graduate and Postdoctoral Studies. It is the responsibility of students to inform themselves of these details at the commencement of their programs. For more information, see *Programs, Courses and University Regulations > University Regulations and Resources > Graduate > Guidelines and Policies > : Ph.D. Comprehensives Policy*.

Language Requirements – Doctoral

Most graduate departments in the Faculties of Agricultural and Environmental Sciences, Education, Engineering, Management, Medicine, and Science do not require a language examination. Students should inquire in their departments if there are any such requirements or whether any other requirements have been substituted for those relating to languages.

Graduate departments in the Faculties of Arts, Music, and Religious Studies usually require proficiency in one or two languages other than English. In all cases, **students should consult departmental regulations concerning language requirements**.

Language requirements for the Ph.D. degree are met through demonstrated reading knowledge. The usual languages are French, German, or Russian, but in particular instances another language may be necessary.

All language requirements must be fulfilled and the grades reported before submission of the thesis to GPS (Thesis Section).

Students must contact their departments to make arrangements to take the Language Reading Proficiency Examinations. Students may, however, demonstrate competence by a pass standing in two undergraduate language courses taken at McGill (see departmental regulations).

Candidates are advised to discharge their language requirements as early in their program as possible.

Students expecting to enrol in Professional Corporations in the province of Quebec are advised to become fluent in both spoken and written French.

Courses in French language are available at the English and French Language Centre. The teaching is intensive and class sizes are kept small. While undergraduate students are given preference, graduate students who are certain they can devote sufficient time to the work may enrol.

Thesis – Doctoral

The thesis for the Ph.D. degree must display original scholarship expressed in good literate style and must be a distinct contribution to knowledge. **Formal notice of a thesis title and names of examiners must be submitted to the Thesis Section of GPS on the *Nomination of Examiners* form in accordance with the dates on www.mcgill.ca/importantdates, at the same time as the thesis is submitted.** The list of examiners must be approved by the Department Chair, the supervisor and the student. The Thesis Section of GPS should be notified of any subsequent change of title as early as possible. Guidelines and deadlines are available at www.mcgill.ca/gps/thesis/guidelines.

Seven copies of the thesis must be provided by the candidate. Of these, two copies will be retained by the University and five copies returned to the candidate. Some departments may require one or more additional copies. The final corrected copy is submitted electronically.

Special regulations for the Ph.D. degree in particular departments are stated in the entries of those departments.

Thesis Oral Examination – Doctoral

After the thesis has been received and approved, a final oral examination is held on the subject of the thesis and subjects intimately related to it. This is conducted in the presence of a Committee of at least five members presided over by a Pro-Dean nominated by Graduate and Postdoctoral Studies. The Chair of the candidate's department and the Thesis Supervisor are regularly invited to be members of the Committee; at least one member of the Committee is appointed from outside the candidate's department. Guidelines are available at www.mcgill.ca/gps/thesis/guidelines.

5.3 Ad Personam Programs (Thesis Option Only)

In very rare circumstances, an applicant who wishes to engage in Master's (thesis option only) or Ph.D. studies of an interdisciplinary nature involving joint supervision by two departments, each of which is authorized by the Government of Quebec to offer its own graduate programs, may be admitted to an *Ad Personam* program. For more information, see www.mcgill.ca/gradapplicants/apply/prepare#program and contact the relevant department.

5.4 Coursework for Graduate Programs, Diplomas, and Certificates

Upper-level undergraduate courses (excluding 500 level) may not be considered for degrees, diplomas, and certificates unless they are already listed as required courses in the approved program description. If an upper-level undergraduate course (excluding 500 level) is taken by a graduate student, it must come as a recommendation from the Graduate Program Director in the department. The recommendation must state if the undergraduate course is an additional requirement for the program (must obtain B- or better) or if the course is extra to the program (will be flagged as such on the record and fees will be charged). See document at www.mcgill.ca/gps/students/registration#course.

English and French language courses offered by the French Language Centre (Faculty of Arts) or the School of Continuing Studies may not be taken for coursework credits toward a graduate program.

All substitutions for coursework in graduate programs, diplomas, and certificates must be approved by GPS.

Courses taken at other institutions to be part of the requirements of a program of studies must be approved by GPS before registration. Double counting is not permitted.

6 Graduate Admissions and Application Procedures

Website: www.mcgill.ca/gradapplicants

Email: servicepoint@mcgill.ca

Deadline: Admission to graduate studies operates on a rolling basis; complete applications and their supporting documentation must reach departmental offices on or before the Date for Guaranteed Consideration specified by the department. To be considered for entrance fellowships, where available, applicants must verify the deadlines with individual departments. Meeting minimum admission standards does not guarantee admission.

6.1 Application for Admission

Revision, October 2012. Start of revision.

Application information and the online application form are available at www.mcgill.ca/gradapplicants/apply. Applicants (with some exceptions) are required to provide the names and email addresses of two instructors familiar with their work and who are willing to provide letters of reference in support of the applicant. McGill will request the reference letters on behalf of the applicant. All applicants must themselves upload an unofficial copy of their complete academic record from each university-level institution attended to date. If admitted, each student will be required to send, or ask the appropriate university authorities to send, an official or certified copy of their complete, final academic record from each university-level institution attended to date. McGill graduates do not need to submit McGill transcripts. See www.mcgill.ca/gradapplicants/apply/submitting-your-documents/sending-official-doc for instructions on mailing official documents to McGill. Please note that all documents submitted to McGill University in support of an application to be admitted, including, but not limited to, transcripts, diplomas, letters of reference, and test scores, become the property of McGill University and will not be returned to the applicant or issuing institution under any circumstance.

A **non-refundable** fee of \$100 in Canadian funds **must** accompany each application; otherwise, **it cannot be submitted**. This sum must be paid by credit card when submitting the online application form and is non-refundable. Candidates for Special, Visiting, and Qualifying status must apply and pay the application fee every year (i.e., every Fall term).

It is recommended that applicants submit a list of the titles of courses taken in the major subject, since transcripts often give code numbers only. **Transcripts written in a language other than English or French must be accompanied by a translation prepared by a licensed translator.** An explanation of the grading system used by the applicant's university is essential. The applicant should also indicate the major subject area in which further study is desired.

Completed applications, with uploaded supporting documents, must be submitted according to individual department Dates for Guaranteed Consideration. Applicants should contact the department concerned, or see: www.mcgill.ca/gradapplicants/programs. International students are advised to apply well in advance of the Date for Guaranteed Consideration as immigration procedures may be lengthy. Applications received after the prescribed Dates for Guaranteed Consideration may or may not be considered, at the discretion of the department. Candidates will be notified of acceptance or refusal by Enrolment Services.

Admission to graduate programs at McGill is highly competitive and the final decision rests with the Graduate Admissions Committee. Admission decisions are not subject to appeal or reconsideration.

Revision, October 2012. End of revision.

6.2 Admission Requirements (minimum requirements to be considered for admission)

Revision, October 2012. Start of revision.



Note: The following admission requirements are the minimum standard for applicants to McGill's Graduate and Postdoctoral Studies programs. Some graduate units may require additional qualifications or a higher minimum CGPA; prospective students are strongly urged to consult the unit concerned regarding specific requirements set for their program of interest.

Applicants should be graduates of a university of recognized reputation and hold a bachelor's degree or its equivalent, as determined by McGill, in a subject closely related to the one selected for graduate work.

The applicant must present evidence of academic achievement: a minimum standing equivalent to a cumulative grade point average (CGPA) of 3.0 out of a possible 4.0 or a CGPA of 3.2/4.0 for the last two full-time academic years. High grades are expected in courses considered by the department to be preparatory to the graduate program. Some departments impose additional or higher requirements.

See www.mcgill.ca/gradapplicants/apply/prepare/requirements/international-degree-equivalency for information on grade equivalencies and degree requirements from countries in Europe and around the world. These equivalencies and requirements are provided for information only and are subject to change without notice.

Admission to graduate programs at McGill is highly competitive and the final decision rests with the Graduate Admissions Committee. Admission decisions are not subject to appeal or reconsideration.

Revision, October 2012. End of revision.

6.3 Application Procedures (for All Admissions Starting Summer 2013)

Revision, October 2012. Start of revision.

Application Checklist

All supplemental application materials and supporting documents must be uploaded directly to the McGill admissions processing system. See www.mcgill.ca/gradapplicants/apply/submitting-your-documents for information and instructions.

1. **Online Application for Admission form:** www.mcgill.ca/gradapplicants/apply/ready.
2. **Application fee:** \$100 for each form you submit (you may indicate two programs on each form), payable by credit card when you submit the form. Some programs may charge additional fees. If applicable these will be automatically charged when you submit the application form.
3. **Transcripts:** your complete record of study from each university-level institution you have attended to date. Uploaded copies will be considered as unofficial; final, official copies will be required once you are offered admission.
4. **Reference letters:** on the application form you must provide the names and email addresses of at least two professors who are familiar with your academic work. McGill will contact these referees and invite them to upload references on your behalf. N.B. some departments require more than two referees; please consult *Admission Requirements and Application Procedures* for each department at www.mcgill.ca/gradapplicants/programs.
5. **TOEFL/IELTS, GRE, GMAT results:** when registering for the test please ensure that you request that results be sent directly to McGill University. McGill will then receive the results electronically, directly from the testing agency.

For detailed information regarding additional documents that may be required by certain departments, please consult *Admission Requirements and Application Procedures* for each department at www.mcgill.ca/gradapplicants/programs.

6.3.1 Document Checklist Terms

The following terms appear on the Document Checklist and are items or documents that you may be required to upload as part of your application for admission. Please ensure that your use of certain terms conforms to the following definitions:

Audition: a trial performance where a performer demonstrates their suitability or skill.

Curriculum Vitae: an overview of the applicant's experience and other qualifications, including employment, academic credentials, publications, contributions, and significant achievements.

GMAT: Graduate Management Aptitude Test (see [section 6.4: Admission Tests](#))

GRE: Graduate Records Examination (see [section 6.4: Admission Tests](#))

Interview: a conversation between the applicant and a McGill representative, using a structured, standardized approach to allow for comparison and analysis of responses from all applicants interviewed; in person, via telephone, *Skype*, etc.

Personal Statement: an essay in which the applicant describes their reasons for applying to graduate studies and indicating qualifications, qualities, or circumstances the applicant feels to be significant; usually provides information about educational and professional goals and discusses the applicant's interest in the desired field of study.

Portfolio: a collection of the applicant's best work to date, selected by them, and intended to show their mastery of a given style or variety of styles; different samples of their artistic work.

Recording: an unedited recording (audio or video) of the applicant performing at least two contrasting pieces; minimum 20 minutes.

Research Proposal: a detailed description of the proposed program of research, including proposed Thesis Supervisor(s); describes the research background, significance, methodology, and references; may include expected results; may include a detailed curriculum vitae.

TOEFL: Test of English as a Foreign Language (see [section 6.5: Competency in English](#))

Writing Sample: a recent sample of the applicant's written work, on any topic (not necessarily within the desired field of graduate study) and not necessarily previously submitted for evaluation or publication.

Written Work: a sample of the applicant's written work, drawn from essays, papers or other work previously submitted for academic evaluation or publication, and falling within the desired field of graduate study.

Revision, October 2012. End of revision.

6.4 Admission Tests

Revision, October 2012. Start of revision.

Graduate Record Examination (GRE)

The Graduate Record Examination (GRE) (Educational Testing Service, Princeton, NJ 08540) consists of a relatively advanced test in the candidates' specialty, and a general test of their attainments in several basic fields of knowledge for which no special preparation is required or recommended. It is offered at many centres, including Montreal, several times a year; the entire examination takes about eight hours, and there is a registration fee. Refer to www.ets.org/gre for further information. Only some departments require applicants to write the GRE examination, but all applicants who have written either the general aptitude or the advanced test are advised to ensure that official test results are sent to McGill directly by the testing service.

This credential is of special importance in the case of applicants whose education has been interrupted, or has not led directly toward graduate study in the subject selected. In such cases the department has the right to insist on a report from the Graduate Record Examination or some similar test. High standing in this examination will not by itself guarantee admission. The Miller Analogies Test may be used similarly. Some departments of the Faculty of Education also require the taking of various tests.

Graduate Management Admissions Test (GMAT)

Applicants to graduate programs in Management must ensure that official results are released to McGill by the Graduate Management Admission Council (GMAC). The test is a standardized assessment offered by the GMAC to help business schools assess candidates for admission. For further information, see www.mba.com/the-gmat.

Revision, October 2012. End of revision.

6.5 Competency in English

Applicants to graduate studies must demonstrate an adequate level of proficiency in English **prior to admission**, regardless of citizenship status or country of origin.

Normally, applicants meeting any one of the following conditions are NOT required to submit proof of proficiency in English:

1. Mother tongue (language first learned and still used on a daily basis) is English.
2. Has obtained (or is about to obtain) an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction.
3. Has obtained (or is about to obtain) an undergraduate or graduate degree from a recognized institution in Canada or the United States of America (anglophone or francophone).
4. Has lived and attended university, or been employed, for at least four consecutive years, in a country where English is the acknowledged primary language.

Applicants who do not meet any of the above-listed conditions must demonstrate proficiency in English using **one** of the following options:

1. TOEFL (Test of English as a Foreign Language): minimum acceptable scores are:

Competency in English

iBT (Internet-based test)

PBT (paper-based test)

CBT (computer-based test)*

86 overall (no less than 20 in each of the four component scores)

550

* The CBT is no longer being offered and CBT results are no longer considered valid, or being reported by ETS.

N.B. an institutional version of the TOEFL is not acceptable.

2. IELTS (International English Language Testing System): a band score of 6.5 or greater.
3. MELAB (Michigan English Language Assessment Battery): a grade of 85% or higher.
4. University of Cambridge ESOL Certificate in Advanced English (CAE): a grade of "B" (Good) or higher.
5. University of Cambridge ESOL Certificate of Proficiency in English (CPE): a grade of "C" (Pass) or higher.
6. Edexcel London Test of English – Level 5 – with an overall grade of at least "Pass."
7. McGill Certificate of Proficiency in English or McGill Certificate of Proficiency – English for Professional Communication: Certificate of Proficiency awarded. McGill Certificate of Proficiency in English or McGill Certificate of Proficiency – English for Professional Communication: Certificate of Proficiency awarded.

In each case, applicants must ensure that official test results are sent to McGill directly by the testing service. Applications cannot be considered if test results are not available. These scores are general minima; some departments may set higher requirements.

Revised – July 2008

6.6 Admission to a Qualifying Program

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 for a master's. The undergraduate-level courses to be taken in a Qualifying Program will be prescribed by the department concerned.

Qualifying students are registered in graduate studies, **but not as candidates for a degree**. Only one Qualifying year (i.e., two full-time terms) is permitted.

In all cases, after the completion of a Qualifying year or term, an applicant interested in commencing a degree program must apply for admission by the Dates for Guaranteed Consideration. Successful completion of the work in the Qualifying Program (B- in all courses) does not automatically entitle the student to proceed toward a degree. Qualifying year students must apply for admission to the program for which they seek qualification.

In cases where a department recommends a change of registration from Qualifying Program (Fall) to Master's Degree First Year (Winter), **students must apply to the degree program by the Winter departmental Dates for Guaranteed Consideration**. A Qualifying year applicant admitted to a Winter term as a first term of studies must apply for admission for a Fall term as his/her second term of studies.

Students who are ineligible for a Qualifying Program may apply to the appropriate undergraduate faculty for admission as regular or Special Students, and seek admission to graduate studies at a later date. The normal admission requirements must be met and the usual procedures followed.

6.7 Admission to a Second Degree Program

A candidate with a given higher degree may apply for admission to a second degree program at the same level but **in a different subject**. The normal admission requirements must be met and all the usual procedures followed.

6.8 Admission to Two Degree Programs

Revision, December 2012. Start of revision.

Students may, with special permission granted by the Graduate Admissions Committee (composed of the Dean and Associate Deans of Graduate and Postdoctoral Studies) and in consultation with the Graduate Admissions Unit of Enrolment Services, be admitted to two degree programs or to two departments or faculties. Students are **never** permitted to pursue two **full-time** degree programs concurrently.

Revision, December 2012. End of revision.

6.9 Admission to an Ad Personam Joint Program

Ad Personam joint graduate programs are restricted to Master's thesis option and Ph.D. programs. Approval for the joint program must be obtained from Graduate and Postdoctoral Studies. The request shall be signed by the Chairs of both departments involved and shall explicitly list the conditions imposed. The student shall undertake research under the joint supervision of both departments.

This program is described in more detail at www.mcgill.ca/gradapplicants/apply/prepare#program.

6.10 Reinstatement and Admission of Former Students

Revision, December 2012. Start of revision.

Students who have not been registered for a period of less than two years and who have not officially withdrawn from the University by submitting a signed Withdrawal Form to Service Point are eligible to be considered for reinstatement into their program. The student's department must recommend, in writing, that the student be reinstated, stipulating any conditions for reinstatement that it deems appropriate. If the student's department chooses not to recommend reinstatement, the student may appeal to the Associate Dean (Graduate and Postdoctoral Studies). The decision of the Associate Dean (Graduate and Postdoctoral Studies) shall be final and not subject to further appeal.

Revision, December 2012. End of revision.

Reinstatement fees will be charged in addition to the fees due for the academic session into which the student has been reinstated. The amount of the reinstatement fees is the tuition portion of fees owed for all unregistered terms, up to a maximum of two years just prior to the term of reinstatement.

If an individual has not registered for a period of more than two years, their student file will be closed. These individuals and those who have formally withdrawn may be considered for admission. Applicants' admission applications will be considered as part of the current admission cycle, in competition with other people applying during that cycle and in accordance with current graduate admission procedures and policies.

Procedure: Requirements for completion of the program will be evaluated. Some of these requirements may need to be redone or new ones may be added. Applicants must inquire about the fees that will be charged.

Revised – Council of February 9, 2004.

6.11 Deferral of Admission

Under exceptional circumstances, an admission for a particular semester can be considered for a deferral. This can be considered only if the student has not registered. If the student has already registered, no deferral can be granted. The student must withdraw from the University and apply for admission to a later term.

7 Fellowships, Awards, and Assistantships

Graduate and Postdoctoral Studies
(Fellowships and Awards Section)
James Administration Building, Room 400
845 Sherbrooke Street West
Montreal, QC H3A 0G4
Telephone: 514-398-3990
Fax: 514-398-2626
Website: www.mcgill.ca/gps/students/funding/students-postdocs

The Fellowships and Awards section of Graduate and Postdoctoral Studies provides processing services for many sources of support for Canadian and non-Canadian students, both new to McGill and continuing. Further information on these and other sources of funding can be found in various publications on the Fellowships and Awards web pages. The [Graduate Fellowships and Awards Calendar](#) lists all internal awards as well as numerous external awards.

Entrance Fellowships are awarded on the basis of the application for admission, upon nomination by academic departments. Most internal fellowships are awarded in this manner—please contact the proposed academic department directly for further information.

Research assistantships, teaching assistantships, and stipends from professors' research grants are handled by individual academic departments at McGill. Fellowships, assistantships, and stipends are used to make funding packages for graduate students. All assistantship and stipend inquiries should be directed to departments.

A small number of citizens from countries whose governments have entered into agreements on tuition fees with Quebec may be exempted from the supplemental tuition fees normally required of international students. All French citizens and a limited number of citizens of countries in the list, which can be found at www.mels.gouv.qc.ca/sections/publications/index.asp?page=fiche&id=1039, are eligible for such exemptions. For more information and the necessary application materials, see www.mels.gouv.qc.ca/international/index_en.asp?page=progExemp. The list of organizations where students should apply can be accessed from this website.

Differential Fee Waivers (DFWs) for international students provide eligible non-Canadian graduate students with waivers of the international tuition fee supplement. There are no application forms for differential fee waivers, since these are awarded on the basis of departmental nominations made to the Fellowships and Awards section. Eligible students should contact their McGill department.

8 Postdoctoral Research

Students must inform themselves of University rules and regulations and keep abreast of any changes that may occur. The *Postdoctoral Research* section of this publication contains important details required by postdoctoral scholars during their studies at McGill and should be periodically consulted, along with other sections and related publications.

8.1 Postdocs

Postdocs are recent graduates with a Ph.D. or equivalent (i.e., Medical Specialist Diploma) engaged by a member of the University's academic staff, including Adjunct Professors, to assist him/her in research.

Postdocs must be appointed by their department and registered with Enrolment Services in order to have access to University facilities (library, computer, etc.).

8.2 Guidelines and Policy for Academic Units on Postdoctoral Education

The general guidelines listed below are meant to encourage units to examine their policies and procedures to support postdoctoral education. Every unit hosting Postdocs should have explicitly stated policies and procedures for the provision of postdoctoral education as well as established means for informing Postdocs of policies, procedures, and privileges (e.g., orientation sessions, handbooks, etc.), as well as mechanisms for addressing complaints. Academic units should ensure that their policies, procedures and privileges are consistent with these guidelines and the Charter of Students' Rights. For their part, Postdocs are responsible for informing themselves of policies, procedures, and privileges.

1. Definition and Status

i. Postdoctoral status will be recognized by the University in accordance with Quebec provincial regulations. Persons may only be registered with postdoctoral status for a period of up to five years from the date they were awarded a Ph.D. or equivalent degree. Time allocated to parental or health leave is added to this period of time. Leaves for other reasons, including vacation leave, do not extend the term. Postdocs must do research under the supervision of a McGill professor, including Adjunct Professors, who is a member of McGill's academic staff qualified in the discipline in which training is being provided and with the abilities to fulfil responsibilities as a supervisor of the research and as a mentor for career development. They are expected to be engaged primarily in research with minimal teaching or other responsibilities.

2. Registration

i. Postdocs must be registered annually with the University through Enrolment Services. Initial registration will require an original or notarized copy of the Ph.D. diploma. Registration will be limited to persons who fulfil the definition above and for whom there is an assurance of appropriate funding and where the unit can provide assurance of the necessary resources to permit postdoctoral education.

ii. Upon registration, the Postdoc will be eligible for a University identity card issued by Enrolment Services.

3. Appointment, Pay, Agreement of Conditions

i. Appointments may not exceed your registration eligibility status.

ii. In order to be registered as a Postdoc, you must be assured of financial support other than from personal means during your stay at McGill University, equivalent to the minimal stipend requirement set by the University in accordance with guidelines issued by federal and provincial research granting agencies. There are no provisions for paid parental leave unless this is stipulated in the regulations of a funding agency outside the University.

iii. At the outset of a postdoctoral appointment, a written Letter of Agreement for Postdoctoral Education should be drawn up and signed by the Postdoc, the supervisor, and the department head or delegate (see template Letter of Agreement and supporting document—*Commitments of Postdoctoral Scholars and Supervisors*—on the web at www.mcgill.ca/gps/postdocs/fellows/letter). This should stipulate, for example, the purpose of the postdoctoral appointment (research training and the advancement of knowledge), the duration of the fellowship/financial support, the modality of pay, the work space, travel funds, and expectations and compensation for teaching and student research supervision. Leaves from postdoctoral education must comply with the Graduate and Postdoctoral Studies Policies for Vacation, Parental/Familial, and Health Leave (see [section 8.3: Vacation Policy for Graduate Students and Postdocs and Programs, Courses and University Regulations > University Regulations and Resources > Graduate > : Health and Parental/Familial Leave of Absence Policy](#)). Any breach of these conditions may result in grievance procedures or the termination of the postdoctoral appointment.

iv. Postdocs with full responsibility for teaching a course should be compensated over and above their fellowship at the standard rate paid to lecturers by their department.

v. The amount of research, teaching, or other tasks that Postdocs engage in over and above postdoctoral activities should conform to the regulations for Postdocs specified by the Canadian research council of their discipline. This applies to all Postdocs, including those whose funding does not come from the Canadian research councils.

4. Privileges

i. Postdocs have the same pertinent rights as the ones granted to McGill students in the *Handbook on Student Rights and Responsibilities* ("Green Book"), available at www.mcgill.ca/secretariat/policies/students.

ii. Postdocs have full graduate student borrowing privileges in McGill libraries through their identity card.

iii. As a rule, Postdocs who are Canadian citizens or who have Permanent Resident status may take courses for credit. Admission to such courses should be sought by submitting application documents directly to the appropriate program by the Postdoc. They must be admitted by the department offering the courses as Special Students. These Postdocs may only be enrolled as part-time students in non-degree granting programs. They will be charged fees for these courses.

iv. Postdocs may be listed in the McGill directory. The Computing Centre will grant Postdocs email privileges on the same basis as graduate students upon presentation of a valid identity card.

v. The Department of Athletics will grant Postdocs access to sports facilities upon presentation of their identity card. A fee will be charged on an annual or term basis.

vi. Postdocs are mandatory members of the Post-Graduate Students' Society (PGSS) and an annual association fee is automatically charged. PGSS fees are mandatory. Postdocs are permitted membership in the Faculty Club; an annual fee will be charged for this membership.

vii. Postdocs are encouraged to participate in Professional Development Workshops provided by Graduate and Postdoctoral Studies and Teaching and Learning services. These sessions are usually free of charge.

viii. Postdocs have access to the services provided by the Ombudsperson.

ix. Postdocs may enrol as part-time students in the second language written and spoken English/French courses offered by the School of Continuing Studies/French Language Centre. Postdocs will be charged tuition for these courses. International Postdocs may be required to obtain a CAQ and a Study Permit.

x. Access to student services and athletic services are available to the Postdoc on an opt-in basis. Fees are applicable.

5. Responsibilities

i. Postdocs are subject to the responsibilities outlined in the *Handbook on Student Rights and Responsibilities* (“Green Book”), available at www.mcgill.ca/secretariat/policies/students.

ii. Each academic unit hosting Postdocs should clearly identify Postdocs’ needs and the means by which they will be met by the unit.

iii. Each academic unit should assess the availability of research supervision facilities, office space, and research funding before recruiting Postdocs.

iv. Some examples of responsibilities of the department are:

- to verify the Postdoc’s eligibility period for registration;
- to provide Postdocs with departmental policy and procedures that pertain to them;
- to oversee the registration and appointment of Postdocs;
- to assign departmental personnel (e.g., Postdoc coordinator and Graduate Program Director) the responsibility for Postdocs;
- to oversee and sign off on the Letter of Agreement for Postdoctoral Education;
- to ensure that each Postdoc has a supervisor, lab and/or office space, access to research operating costs and necessary equipment;
- to include Postdocs in departmental career and placement opportunities;
- to refer Postdocs to the appropriate University policies and personnel for the resolution of conflict that may arise between a Postdoc and a supervisor.

v. Some examples of responsibilities of the supervisor are:

- to uphold and transmit to their Postdocs the highest professional standards of research and/or scholarship;
- to provide research guidance;
- to meet regularly with their Postdocs;
- to provide feedback on research submitted by the Postdocs;
- to clarify expectations regarding intellectual property rights in accordance with the University’s policy;
- to provide mentorship for career development;
- to prepare, sign, and adhere to a Letter of Agreement for Postdoctoral Education.

vi. Some examples of responsibilities of Postdocs are:

- to inform themselves of and adhere to the University’s policies and/or regulations for Postdocs for leaves, for research, and for student conduct as outlined in the *Handbook on Student Rights and Responsibilities* and the Graduate and Postdoctoral Studies *University Regulations and Resources*;
- to submit a complete file for registration to Enrolment Services;
- to sign and adhere to their Letter of Agreement for Postdoctoral Education;
- to communicate regularly with their supervisor;
- to inform their supervisor of their absences.

vii. Some examples of the responsibilities of the University are:

- to register Postdocs;
- to provide an appeal mechanism in cases of conflict;
- to provide documented policies and procedures to Postdocs;
- to provide Postdocs with the necessary information on McGill University student services.

Approved by Senate, April 2000

8.3 Vacation Policy for Graduate Students and Postdocs

Graduate students and Postdocs should normally be entitled to vacation leave equivalent to university holidays and an additional total of fifteen (15) working days in the year. Funded students and Postdocs with fellowships and research grant stipends taking additional vacation leave may have their funding reduced accordingly.

Council of FGSR April 23, 1999

8.4 Leave of Absence for Health and Parental/Familial Reasons

A leave of absence may be granted for maternity or parental reasons or for health reasons (see *Programs, Courses and University Regulations > University Regulations and Resources > Graduate > : Health and Parental/Familial Leave of Absence Policy*).

Such a leave must be requested on a term-by-term basis and may be granted for a period of up to 52 weeks. Students and Postdocs must make a request for such a leave in writing to their department and submit a medical certificate. The department shall forward the request to Enrolment Services. See procedure under *Programs, Courses and University Regulations > University Regulations and Resources > Graduate > : Health and Parental/Familial Leave of Absence Policy*. Students who have been granted such a leave will have to register for the term(s) in question and their registration will show as “leave of absence” on their record. No tuition fees will be charged for the duration of the authorized leave. Research supervisors are not obligated to remunerate students and Postdocs on leave. GPS has prepared a summary table of various leave policies (paid or unpaid) for students and Postdocs paid from the Federal and Quebec Councils through fellowships or research grants. The document is available at www.mcgill.ca/gps/students/progress/leave-vacation under “Information on the Funding Council Leave Policies for Graduate Students and Postdoctoral Fellows.”

8.5 Postdoctoral Research Trainees

Eligibility

If your situation does not conform to the Government of Quebec's definition of Postdoctoral Fellow, you may be eligible to attend McGill as a Postdoctoral Research Trainee. While at McGill, you can perform research only (you may not register for courses or engage in clinical practice). Medical specialists who will have clinical exposure and require a training card must register through Postgraduate Medical Education of the Faculty of Medicine—not Graduate and Postdoctoral Studies.

The category of Postdoctoral Research Trainee is for:

Category 1: An individual who has completed requirements for the Doctoral degree or medical specialty, but the degree/certification has not yet been awarded. The individual will subsequently be eligible for registration as a Postdoctoral Fellow.

Category 2: An individual who is not eligible for Postdoctoral Registration according to the Government of Quebec's definition, but is a recipient of an external postdoctoral award from a recognized Canadian funding agency.

Category 3: An individual who holds a professional degree (or equivalent) in a regulated health profession (as defined under CIHR-eligible health profession) and is enrolled in a program of postgraduate medical education at another institution. The individual wishes to conduct the research stage or elective component of his/her program of study at McGill University under the supervision of a McGill professor. The individual will be engaged in full-time research with well-defined objectives, responsibilities, and methods of reporting. The application must be accompanied by a letter of permission from the home institution (signed by the Department Chair, Dean or equivalent) confirming registration in their program and stating the expected duration of the research stage. Individuals who are expecting to spend more than one year are encouraged to obtain formal training (master's or Ph.D.) through application to a relevant graduate program.

Category 4: An individual with a regulated health professional degree (as defined under CIHR-eligible health profession), but not a Ph.D. or equivalent or medical specialty training, but who fulfils criteria for funding on a tri-council operating grant or by a CIHR fellowship (up to maximum of five years post-degree).



Note: Individuals who are not Canadian citizens or permanent residents must inquire about eligibility for a work permit.

General Conditions

- The maximum duration is three years;
- the individual must be engaged in full-time research;
- the individual must provide copies of official transcripts/diploma;
- the individual must have the approval of a McGill professor to supervise the research and of the Unit;
- the individual must have adequate proficiency in English, but is not required to provide official proof of English competency to Enrolment Services;
- the individual must comply with regulations and procedures governing research ethics and safety and obtain the necessary training;
- the individual will be provided access to McGill libraries, email, and required training in research ethics and safety. Any other University services must be purchased (e.g., access to athletic facilities);
- the individual must arrange for basic health insurance coverage prior to arrival at McGill and may be required to provide proof of coverage.

9 Graduate Studies Guidelines and Policies

Refer to *Programs, Courses and University Regulations > University Regulations and Resources > Graduate > : Guidelines and Policies* for information on the following:

- Guidelines and Regulations for Academic Units on Graduate Student Advising and Supervision
- Policy on Graduate Student Research Progress Tracking
- Ph.D. Comprehensives Policy
- Graduate Studies Reread Policy
- Health and Parental/Familial Leave of Absence Policy
- Failure Policy
- Guideline on Hours of Work

10 Information on Research Policies and Guidelines, Patents, Postdocs, Associates, Trainees

Refer to *Programs, Courses and University Regulations > University Regulations and Resources > Graduate > : Research Policy and Guidelines, Patents, Postdocs, Associates, Trainees* for information on the following:

- Policy on Research Ethics
- Regulations on Research Policy
- Policy on Research Integrity
- Guidelines for Research Involving Human Subjects
- Guidelines for Research with Animal Subjects
- Policy on Intellectual Property
- Regulations Governing Conflicts of Interest
- Safety in Field Work
- Office of Sponsored Research
- Postdocs
- Research Associates

11 Academic Programs

The programs and courses in the following sections have been approved for the 2012–2013 session as listed, but the Faculty reserves the right to introduce changes as may be deemed necessary or desirable.

11.1 Anatomy and Cell Biology

11.1.1 Location

Department of Anatomy and Cell Biology
Strathcona Anatomy and Dentistry Building
3640 University Street, Room 1/60
Montreal, QC H3A 0C7
Canada

Telephone: 514-398-6335

Fax: 514-398-5047

Website: www.mcgill.ca/anatomy

11.1.2 About Anatomy and Cell Biology

In addition to laboratory-specific activities, students will attend weekly seminars presented by nationally and internationally recognized researchers (www.mcgill.ca/anatomy/seminar-series). Students will also present their results once a year to other students in the program in the Research in Progress seminar series.

Current research projects include:

- cell biology of secretion
- cell biology of endocytosis
- signal transduction of cell receptors for growth factors and hormones
- synthesis and migration of glycoproteins
- subcomponents of the Golgi apparatus and their function
- biogenesis and function of lysosomes
- cell turnover in various tissues
- control of cell growth and proliferation
- molecular biology of extracellular matrix
- structure, composition, and function of basement membranes and connective tissue microfibrils
- cell and microfibrils
- cell and molecular biology of spermatogenesis
- genetic expression of proteins in the formation of cytoskeletal components of spermatozoa
- role of endocytosis and secretion by epididymal cells in sperm maturation
- molecular biology of Sertoli cell secretions and their interaction with germ cells
- synchronization of sperm production
- transferrin, transferrin receptors, and iron in germinal cells
- differentiation of B lymphocytes in bone marrow in relation to mechanisms of humoral immunity, immunodeficiency states, and B cell neoplasias
- control mechanisms and cytokines in B lymphopoiesis
- in situ organization and stromal cell-interactions of B lineage precursor cells in bone marrow
- microenvironmental regulation of hemopoiesis
- differentiation and regulation of cells mediating natural tumour immunosurveillance
- tumour cell biology
- cell and molecular biology of the formation of dental enamel, dentin, and bone
- structure of organic matrices and inorganic crystals of dental enamel
- role of hormones and their binding sites with calcified tissues
- secretion and degradation of the proteins of enamel matrix, hypothalamo-pituitary function and gonadotropin patterns in ovarian follicular development
- polycystic ovarian disease
- computer-assisted modelling of morphometric and kinetic data
- cell biology and molecular genetics of aging
- senescence and cell cycle-specific genes and their products
- cryo-electron microscopy

The **Human Systems Biology Stream** is offered as a complementary stream to the existing M.Sc. and Ph.D. programs entailing a multidisciplinary approach to achieving an M.Sc. and Ph.D. in Cell Biology and Anatomy. The primary objective of this stream is to offer graduate students academic training in Human Systems Biology. This is an exciting and new multidisciplinary field that aims to understand molecular human diseases at the systems level.

Research in the Department investigates the dynamics and organization of molecules, organelles, cells, and tissues in several major systems of the body. The work makes fundamental contributions to a number of established and emerging multidisciplinary fields: cell and molecular biology, cellular immunology and hematology, reproductive biology, calcified tissue biology, tumour cell biology, developmental biology, neurobiology, and aging.

The Department offers contemporary facilities for the wide range of techniques currently employed in research. Modern methods of cell and molecular biology, immunology, and biochemistry are used in conjunction with specialized microscopy in a variety of experimental systems. Techniques used by Department members include:

- labelling with radioisotopes and other tracers
- radioautography
- immunocytochemistry
- histochemistry
- cryo-immune microscopy
- fluorescence microscopy
- high-resolution electron microscopy
- scanning electron microscopy
- backscattered electron imaging

- confocal microscopy
- 3D cryo-electron microscopy
- microinjection
- video-microscopy in living cells
- X-ray microanalysis
- electron diffraction
- freeze-fracture replication
- computer reconstruction and quantitation
- chromatography
- subcellular fractionation
- recombinant DNA technology
- in situ hybridization
- tissue grafting
- cell and tissue culture
- mutant and transgenic mice
- hybridomas
- monoclonal antibodies

The Department has one of the largest and best-equipped electron microscope facilities in the world. Currently in use are four modern electron microscopes, including a Tecnai F20 and a Titan Krios. Combined with some of these microscopes are computer-aided analytical equipment capable of elemental microanalysis, histomorphometry, reconstruction, and quantitation. The high-voltage microscope is particularly useful for certain analytical electron optical procedures such as electron diffraction, lattice imaging, and three-dimensional electron microscopy.

section 11.1.5: Master of Science (M.Sc.); Cell Biology (Thesis) (45 credits)

Graduate research activities leading to the presentation of the M.Sc. thesis involve original experimental work in one of the areas being actively investigated by the Department's research supervisors. Our graduate program offers training in a personal, unique, and multidisciplinary environment in the top Canadian university with worldwide recognition. The thesis-based master training is intended for students with a B.Sc. or B.A. degree in life sciences from a university of recognized reputation. Candidates with an M.D., D.D.S., or D.V.M. degree are also welcome. The students are trained in how to address biological problems with an integrative understanding of cell biology by conducting hypothesis-driven projects. The training provides all the tools required for a competitive career, in academic settings as well as in industry or other fields.

section 11.1.6: Doctor of Philosophy (Ph.D.); Cell Biology

Graduate research activities leading to the presentation of the Ph.D. thesis involve original experimental work in one of the areas being actively investigated by the Department's research supervisors. Our graduate program offers training in a personal, unique, and multidisciplinary environment in the top Canadian university with worldwide recognition. The thesis-based Ph.D. training is intended for students with a B.Sc., B.A., or M.Sc. degree in life sciences from a university of recognized reputation. Candidates with an M.D., D.D.S., or D.V.M. degree are also welcome. The students are trained in how to address biological problems with an integrative understanding of cell biology by conducting hypothesis-driven projects. The training provides all the tools required for a competitive career, in academic settings as well as in industry or other fields.

11.1.3 Anatomy and Cell Biology Admission Requirements and Application Procedures

11.1.3.1 Admission Requirements

Revision, October 2012. Start of revision.

M.Sc. and Ph.D. Programs

1. A B.Sc. degree in life sciences or any of M.D., D.D.S., or D.V.M. degrees from a university of recognized reputation.
2. Evidence of a high academic achievement with a minimum cumulative grade point average (CGPA) of 3.0 on 4.0 as indicated in the general guidelines set up by GPS at McGill.
3. Students must follow the guidelines for English Language Proficiency at www.mcgill.ca/gradapplicants/apply/prepare/requirements/proficiency.
4. M.Sc. and Ph.D. students are supported financially, at a minimum of \$15,000 and \$17,000 respectively, per year.

Graduate students are also expected to apply for the various internal and external fellowships. Detailed information is available at www.mcgill.ca/anatomy/graduate/fellowships. Graduate students are responsible for the payment of tuition fees to McGill University. Detailed information about these can be found at www.mcgill.ca/student-accounts/tuition-charges/fallwinter-term-tuition-and-fees/graduate-fees. For international students registered in the M.Sc. and Ph.D. programs, differential fee waivers up to \$5,000 will be allocated to a maximum of eight students through the Department of Anatomy and Cell Biology, for the first year, with a possibility of renewal.

11.1.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

Application for admission to graduate studies for the degrees of M.Sc. or Ph.D. in Cell Biology and Anatomy should be made to the Chair of Graduate Studies, Department of Anatomy and Cell Biology.

Program guidelines are detailed at www.mcgill.ca/anatomy/graduate.

All applicants must first make arrangements with a faculty member of the Department for acceptance into his/her laboratory to carry out the thesis research (www.mcgill.ca/anatomy/graduate/appproc).

11.1.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Agreement of a faculty member to act as Thesis Supervisor

11.1.3.3 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: June 1	Fall: March 15	Fall: Same as Canadian/International
Winter: Nov. 15	Winter: Sept. 30	Winter: Same as Canadian/International
Summer: N/A	Summer: N/A	Summer: N/A



Note: We are not willing to consider any applications to be admitted for the Summer term.

Revision, October 2012. End of revision.

11.1.4 Anatomy and Cell Biology Faculty

Chair

Craig Mandato

Emeritus Professors

Gary C. Bennett; B.A., B.Sc.(Sir G. Wms.), M.Sc., Ph.D.(McG.)

Yves Clermont; B.Sc.(Montr.), Ph.D.(McG.), F.R.C.S.

Dennis G. Osmond; C.M., B.Sc., M.B., Ch.B., D.Sc.(Brist.), M.R.C.S., L.R.C.P., F.R.S.C.

Hershey Warshawsky; B.Sc.(Sir G. Wms.), M.Sc., Ph.D.(McG.)

Professors

Chantal Autexier; B.Sc.(C'dia), Ph.D.(McG.)

Philip Barker; B.Sc.(S. Fraser), Ph.D.(Alta.) (*joint appt. with Neurology & Neurosurgery*)

James R. Brawer; B.S.(Tufts), Ph.D.(Harv.)

Miguel Burnier; M.D., M.Sc., Ph.D.(Brazil) (*joint appt. with Ophthalmology*)

Samuel David; Ph.D.(Manit.) (*joint appt. with Neurology & Neurosurgery*)

Louis Hermo; B.A.(Loyola), M.Sc., Ph.D.(McG.)

Timothy Kennedy; B.Sc.(McM.), M.Phil., Ph.D.(Col.) (*joint appt. with Neurology & Neurosurgery*)

Nathalie Lamarche-Vane; B.Sc., Ph.D.(Montr.)

Marc D. McKee; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Dentistry*)

Peter McPherson; B.Sc.(Manit.), Ph.D.(Iowa) (*joint appt. with Neurology & Neurosurgery*)

Sandra C. Miller; B.Sc.(Sir G. Wms.), M.Sc., Ph.D.(McG.)

Carlos R. Morales; D.V.M.(U.N., Argentina), Ph.D.(McG.)

Professors

Barry I. Posner; M.D.(Manit.), F.R.C.P.(C) (*joint appt. with Medicine*)
 Dieter Reinhardt; M.S.(Kaiserslautern), Ph.D.(Munich) (*joint appt. with Dentistry*)
 Alfredo Ribeiro-da-Silva; M.D., Ph.D.(Oporto) (*joint appt. with Pharmacology and Therapeutics*)
 Charles E. Smith, D.D.S., Ph.D.(McG.)
 Wayne Sossin; S.B.(MIT), Ph.D.(Stan.) (*joint appt. with Neurology & Neurosurgery*)
 Stefano Stifani; Ph.D.(Rome), Ph.D.(Alta.) (*joint appt. with Neurology & Neurosurgery*)
 Dominique Walker; B.Sc., Ph.D.(Geneva) (*joint appt. with Psychiatry*)

Associate Professors

Orest W. Blaschuk; B.Sc.(Winn.), M.Sc.(Manit.), Ph.D.(Tor.) (*joint appt. with Surgery*)
 Eugene Daniels; M.Sc., Ph.D.(Manit.)
 Elaine Davis; B.Sc., M.Sc.(W. Ont.), Ph.D.(McG.)
 M.F. Lalli; B.Sc., M.Sc.(Bowling Green), Ph.D.(McG.)
 Craig Mandato; B.Sc., Ph.D.(Wat.)
 John F. Presley; B.A., Ph.D.(Texas)
 Hojatollah Vali; B.Sc., M.Sc., Ph.D.(Munich) (*joint appt. with Earth and Planetary Sciences*)

Assistant Professors

Fiona Bedford; B.Sc.(Birm.), Ph.D.(Lond.)
 Justin Kollman; Ph.D.(Calif.-San Diego)
 Isabelle Rouiller; Ph.D.(UK)

Associate Members

John J.M. Bergeron; B.Sc.(McG.), D.Phil.(Oxf.)
 Albert Berghuis (*Biochemistry*)
 Colin Chalk (*Neurology & Neurosurgery*)
 Jean-François Cloutier (*Neurology & Neurosurgery*)
 Claudio Cuello (*Pharmacology & Therapeutics*)
 Giovanni DiBattista (*Medicine*)
 Alyson Fournier (*Neurology & Neurosurgery*)
 Janet Henderson (*Medicine*)
 Robert Scott Kiss (*Biochemistry*)
 Bartha Knoppers (*Human Genetics*)
 Svetlana Komarova (*Dentistry*)
 Stephane Laporte (*Medicine*)
 Andréa Leblanc (*Neurology & Neurosurgery*)
 Tommy Nilsson (*Medicine*)
 Christian Rocheleau (*Medicine*)
 Edward S. Ruthazer (*Neurology & Neurosurgery*)
 Michael Sacher (*Biology*)
 Philippe Seguela (*Neurology & Neurosurgery*)
 Peter Siegel (*Medicine & Biochemistry*)
 Thomas Stroh (*Neurology & Neurosurgery*)

Associate MembersDavid Y. Thomas (*Biochemistry*)Jacalyn Vogel (*Biology*)Xiang-Jiao Yang (*Medicine*)**Adjunct Professors**

Michel Cayouette; Ph.D.(Laval)

Frédéric Charron; B.Sc.(Montr.), Ph.D.(McG.)

Miroslaw Cygler; M.Sc., Ph.D.(Lodz, Poland)

Daniel Cyr; B.Sc., M.Sc.(C'dia), Ph.D.(Manit.)

Michel Desjardins; M.Sc., Ph.D.(Montr.)

Jacques Drouin; B.Sc., D.Sc.(Laval)

David Hipfner; B.Sc., Ph.D.(Qu.)

Artur Kania; Ph.D.(Baylor)

André Nantel; B.Sc., M.Sc.(Laval), Ph.D.(Chapel Hill)

Alexei Pshezhetsky; Ph.D.(Russia)

Joseph Schrag; M.Sc., Ph.D.(Ill.)

Atilla Sik; M.Sc., Ph.D.(Hungary)

Pierre Thibault; Ph.D.(Montr.)

Faculty Lecturers

Ayman Behiery; M.B., Ch.B.(Cairo)

Geoffroy P. Noël; Ph.D.(Br. Col.)

11.1.5 Master of Science (M.Sc.); Cell Biology (Thesis) (45 credits)**Thesis Course (24 credits)**

ANAT 698 (24) M.Sc. Thesis Research 1

Required Course (12 credits)

ANAT 601 (3) MSc Seminar Examination

ANAT 695 (3) Seminars in Cell Biology 1

ANAT 696 (3) Seminars in Cell Biology 2

ANAT 697 (3) Seminars in Cell Biology 3

Complementary Courses (9 credits)

6 credits from one of two streams: Cell Developmental Biology Stream or Human Systems Biology Stream

Cell Developmental Biology Stream

ANAT 663D1 (4.5) Histology

ANAT 663D2 (4.5) Histology

ANAT 690D1 (3) Cell and Developmental Biology

ANAT 690D2 (3) Cell and Developmental Biology

Human Systems Biology Stream

6 credits required:

ANAT 690D1	(3)	Cell and Developmental Biology
ANAT 690D2	(3)	Cell and Developmental Biology

3 credits selected from:

BMDE 502	(3)	BME Modelling and Identification
BMDE 519	(3)	Biomedical Signals and Systems
BTEC 501	(3)	Bioinformatics
COMP 564	(3)	Computational Gene Regulation
COMP 680	(4)	Mining Biological Sequences
EXMD 602	(3)	Techniques in Molecular Genetics
MIMM 613	(3)	Current Topics 1
MIMM 614	(3)	Current Topics 2
MIMM 615	(3)	Current Topics 3

Upon consultation with the supervisor, students may select a 3-credit course outside of this list from Biomedical Science courses at the 500-600 level.

11.1.6 Doctor of Philosophy (Ph.D.); Cell Biology**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses

ANAT 690D1	(3)	Cell and Developmental Biology
ANAT 690D2	(3)	Cell and Developmental Biology
ANAT 695	(3)	Seminars in Cell Biology 1
ANAT 696	(3)	Seminars in Cell Biology 2
ANAT 697	(3)	Seminars in Cell Biology 3
ANAT 701	(0)	Ph.D. Comprehensive Examination

11.2 Biochemistry**11.2.1 Location**

Department of Biochemistry
McIntyre Medical Sciences Building
3655 Promenade Sir-William-Osler
Montreal, QC H3G 1Y6
Canada

Christine Laberge: Student Affairs Administrator
Telephone: 514-398-2423
Fax: 514-398-7384

Email: admissions.biochemistry@mcgill.ca
 Website: www.mcgill.ca/biochemistry
 Website: www.mcgill.ca/biochemistry/chemicalbiology
 Website: www.mcgill.ca/biochemistry/bioinformatics

11.2.2 About Biochemistry

The Department of Biochemistry offers M.Sc. and Ph.D. programs, which emphasize laboratory research. Our research interests include molecular and cell biology, the regulation of gene and protein expression, signal transduction, protein structure and function, membrane biology, cell death and differentiation, embryonic development, neurobiology, bioinformatics, and many aspects of cancer. Specialized graduate training programs in Chemical Biology, Human Systems Biology (Bioinformatics), Cancer Research/Oncology (<http://cancercentre.mcgill.ca/research>), and Structural Biology (<http://grasp.mcgill.ca>) are available. Laboratories are located in the new Bellini Life Sciences Building and Goodman Cancer Centre, and the renovated McIntyre Medical Sciences Building, together comprising one of the best-equipped research facilities in Canada. The outstanding quality of our research has been recognized by recent awards including a Gairdner Award, two Killam Prizes, and eight Canada Research Chairs.

Funding

Master's students receive a minimum stipend of \$20,000 annually; doctoral students receive \$22,000. The Department is committed to helping graduate students secure adequate funding for their research. All students are financially supported either by their supervisor or through fellowships or scholarships. Prospective students are urged to make every effort to secure their own funding. Applications may be made for a variety of fellowships administered by the University or by various federal, provincial, or private agencies. For more information on fellowships and awards, see the Graduate and Postdoctoral Studies website, www.mcgill.ca/gps/funding/students-postdocs.

Departmental Seminars

Visiting scientists and senior doctoral students present their research findings to the Department at a regular seminar series throughout the academic year. All graduate students are required to attend the regular seminars and additional special lectures, and are encouraged to attend scientific conferences and symposia.

section 11.2.5: Master of Science (M.Sc.); Biochemistry (Thesis) (45 credits)

The M.Sc. in Biochemistry introduces students to laboratory-based research at an advanced level. The M.Sc. program offers core courses in advanced biochemistry topics, but focuses on laboratory research. The program provides sophisticated training in the technical as well as theoretical aspects of biochemistry, at one of the leading Biochemistry departments in Canada. The M.Sc. program is an excellent preparation for skilled positions in the biomedical sciences, in industry or the public sector, or for superior research in a Ph.D. program.

section 11.2.6: Master of Science (M.Sc.); Biochemistry (Thesis) — Chemical Biology (47 credits)

The Chemical Biology Thematic Group is engaged in a diverse range of research topics, which span structural biology, enzymology, nucleic acid research, signalling pathways, single molecule biophysics, and biophysical chemistry of living tissues. Among the themes that unite the research being performed in this group is the attempt to learn new chemistry and physics from biological systems. We have projects relating to pharmaceutically relevant enzymes such as those involved in drug metabolism and antibiotic resistance; development of therapeutic agents in the control of inflammation, cancer, and viral infections; the chemical biology of NO; quantification of bioenergetic markers of metabolism; self-assembly mechanisms of the HIV-1 virion capsid; liposome microarray systems to address membrane protein dynamics and recognition; studies on reactive oxygen species translocation across the aqueous/lipid membrane interface; RNAi/antisense technologies; dynamic combinatorial chemistry; protein dynamics and function; mechanistic aspects involved in cellular adhesion and transport in membrane and zeolite channels; and cutting-edge microscopes used to examine transport, motility, and reactivity in cells.

The Chemical Biology graduate option is centred on the pursuit of an original research project under the direction of one or more mentors. The program is supported by McGill University and by the Canadian Institutes of Health Research (CIHR) through its Strategic Training Initiatives program.

The program of training incorporates several important features, including a diverse curriculum and programs of seminars, workshops, and discussion groups designed to provide students with a well-rounded exposure to both the chemical and biological aspects of the discipline. The M.Sc. option provides a foundation in the concepts and approaches of Chemical Biology.

Financial support for students in the program is available from a variety of sources, including competitively awarded CIHR-funded Chemical Biology Scholarship awards.

section 11.2.7: Master of Science (M.Sc.); Biochemistry (Thesis) — Bioinformatics (45 credits)

Bioinformatics research lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. The intention of the Bioinformatics option is to train students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyze datasets, the application of modelling techniques, the creation of tools for manipulating bioinformatics data, the integration of biological databases, and the use of algorithms and statistics.

M.Sc. level – Students successfully completing the Bioinformatics option at the M.Sc. level will be fluent in the concepts, language, approaches, and limitations of the field.

The option consists of a number of interdisciplinary courses and a seminar designed to bring students from many backgrounds together and to provide a thorough overview of research in this field.

section 11.2.8: Doctor of Philosophy (Ph.D.); Biochemistry

The Ph.D. in Biochemistry trains students in laboratory-based research at the highest level. The Ph.D. program is streamlined to emphasize independent research, and the many areas of biochemistry studied in our Department offer a wide choice of specialties. Students gain in-depth expertise in biochemistry and the biomedical sciences, with the opportunity to carry out research projects at a world-class level and build collaborations with other leading research groups. Graduates of the Ph.D. program are outstandingly prepared for leadership careers in the basic health sciences in industry, the public sector, or academia.

section 11.2.9: Doctor of Philosophy (Ph.D.); Biochemistry — Chemical Biology

The Chemical Biology Thematic Group is engaged in a diverse range of research topics which span structural biology, enzymology, nucleic acid research, signalling pathways, single molecule biophysics, and biophysical chemistry of living tissues. Among the themes which unite the research being performed in this group is trying to learn new chemistry and physics from biological systems. We have projects relating to pharmaceutically relevant enzymes such as those involved in drug metabolism and antibiotic resistance; development of therapeutic agents in the control of inflammation, cancer and viral infections; the chemical biology of NO; quantification of bioenergetic markers of metabolism; self-assembly mechanisms of the HIV-1 virion capsid; liposome microarray systems to address membrane protein dynamics and recognition; studies on reactive oxygen species translocation across the aqueous/lipid membrane interface; RNAi/antisense technologies; dynamic combinatorial chemistry; protein dynamics and function; mechanistic aspects involved in cellular adhesion and transport in membrane and zeolite channels; and cutting-edge microscopes used to examine transport, motility, and reactivity in cells.

The Chemical Biology graduate option is centred on the pursuit of an original research project under the direction of one or more mentors. The program is supported by McGill University and by the Canadian Institutes of Health Research (CIHR) through its Strategic Training Initiatives program.

The program of training incorporates several important features, including a diverse curriculum and programs of seminars, workshops, and discussion groups designed to provide students with a well-rounded exposure to both the chemical and biological aspects of the discipline. The Ph.D. option provides advanced training in Chemical Biology based on independent research.

Financial support for students in the program is available from a variety of sources, including competitively awarded CIHR-funded Chemical Biology Scholarship awards.

section 11.2.10: Doctor of Philosophy (Ph.D.); Biochemistry — Bioinformatics

Bioinformatics research lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. The intention of the Bioinformatics option is to train students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyze datasets, the application of modelling techniques, the creation of tools for manipulating Bioinformatics data, the integration of biological databases, and the use of algorithms and statistics.

Ph.D. level – Students successfully completing the Bioinformatics option at the Ph.D. level will be fluent in the concepts, language, approaches, and limitations of the field, and have the capability of developing an independent Bioinformatics research program.

The option consists of a number of interdisciplinary courses and a seminar designed to bring students from many backgrounds together and to provide a thorough overview of research in this field.

11.2.3 Biochemistry Admission Requirements and Application Procedures**11.2.3.1 Admission Requirements****Revision, October 2012. Start of revision.**

Admission is based on the candidate's academic record, letters of recommendation, curriculum vitae, and personal statement. A minimum grade point average of 3.2/4.0 (B+) is required. Once a student has submitted all the required documents, the applicant's file will be reviewed by the Graduate Admission Committee. Files that do not meet the minimum requirement will not be considered. Applicants must also be accepted by a research supervisor who is a faculty member or associate member of the Department of Biochemistry. Recommendation for admission will be made once the applicant has secured a supervisor and adequate financial support. Financial support should be in the form of a stipend from the supervisor's research grant or a fellowship held by the student.

Master's Program

Candidates for the M.Sc. degree must hold a B.Sc. degree or its equivalent in Biochemistry or in related disciplines (e.g., biology, chemistry, physiology, microbiology).

Doctoral Program

Candidates who have completed their M.Sc. degree may be admitted directly to the Ph.D. program. Candidates who are admitted to the M.Sc. program and who are interested in the Ph.D. may transfer directly to the Ph.D. program after successfully completing the transfer seminar (BIOC 701) and all course requirements. The M.Sc. thesis requirement is then waived.

International Applicants

Applicants to graduate studies whose mother tongue is not English and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit the following:

TOEFL: Minimum score of 600, or 86 on an Internet-based test with each component score of not less than 20.

or

IELTS: Minimum overall band score of 6.5.

International students who have received their degree outside North America should submit the following:

GRE: Subject Test in Biochemistry, Cell and Molecular Biology with a minimum score of 550. (Not required, but strongly recommended.)

Admission Requirements – Chemical Biology Option

As for the regular graduate programs of the Biochemistry Department, acceptance into the Chemical Biology option consists of two steps:

1. Preliminary approval by the Department's Graduate Admission Committee based on the student's transcript, references, and other documents submitted with the application. The criteria for assessment at this level are the same as for the regular graduate programs of the Department.
2. Acceptance by a Chemical Biology research director. The director must propose a research project for the student that provides training in the methods and philosophy of Chemical Biology. Project proposals are assessed by the Chemical Biology Program Committee.

11.2.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

All applicants are encouraged to contact potential research supervisors during or before the application process since supervisor acceptance is required.

Information about the research interests of faculty members can be found at www.mcgill.ca/biochemistry/research and www.mcgill.ca/biochemistry/about-us-0/department/faculty-members.

11.2.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Curriculum Vitae
- Agreement of a faculty member to act as Thesis Supervisor and to provide adequate financial support
- Personal Statement
- Acceptance by a Chemical Biology research director (for Chemical Biology option only)

11.2.3.3 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: June 1	Fall: March 15	Fall: N/A
Winter: Oct. 15	Winter: Sept. 15	Winter: N/A
Summer: N/A	Summer: N/A	Summer: N/A

Revision, October 2012. End of revision.

11.2.4 Biochemistry Faculty

Chair

David Y. Thomas

Associate Chair

Kalle Gehring

Emeritus Professors

Rhoda Blostein; B.Sc., M.Sc., Ph.D.(McG.), F.R.S.C.

Peter E. Braun; B.Sc., M.Sc.(Br. Col.), Ph.D.(Calif., Berk.)

Robert E. MacKenzie; B.Sc.(Agr.)(McG.), M.N.S., Ph.D.(C'nell)

Edward A. Meighen; B.Sc.(Alta.), Ph.D.(Calif., Berk.)

Walter E. Mushynski; B.Sc., Ph.D.(McG.)

Theodore L. Sourkes; M.Sc.(McG.), Ph.D.(C'nell), F.R.S.C.

Clifford P. Stanners; B.Sc.(McM.), M.A., Ph.D.(Tor.)

Professors

Nicole Beauchemin; B.Sc., M.Sc., Ph.D.(Montr.) (*joint appt. with Oncology and Medicine*)

Albert Berghuis; B.Sc., M.Sc.(Rijks Univ. Groningen, The Netherlands), Ph.D.(Br. Col.) (*Canada Research Chair in Structural Biology*)

Philip E. Branton; B.Sc., M.Sc., Ph.D.(Tor.), F.R.S.C. (*Gilman Cheney Professor of Biochemistry*)

Kalle Gehring; B.A.(Brown), M.Sc.(Mich.), Ph.D.(Calif., Berk.) (*Chercheur National du FRSQ*)

Vincent Giguère; B.Sc., Ph.D.(Laval) (*joint appt. with Oncology & Medicine*)

Philippe Gros; B.Sc., M.Sc.(Montr.), Ph.D.(McG.), F.R.S.C. (*James McGill Professor*)

Roderick R. McInnes; B.Sc., M.D.(Dal.), Ph.D.(McG.)

William Muller; B.Sc., Ph.D.(McG.) (*Canada Research Chair in Molecular Oncology*)

Alain Nepveu; B.Sc., M.Sc.(Montr.), Ph.D.(Sher.) (*James McGill Professor*) (*joint appt. with Oncology & Medicine*)

Morag Park; B.Sc., Ph.D.(Glas.), F.R.S.C. (*Diane & Sal Guerrera Chair in Cancer Genetics*) (*James McGill Professor*) (*joint appt. with Oncology & Medicine*)

Jerry Pelletier; B.Sc., Ph.D.(McG.) (*James McGill Professor*)

Gordon C. Shore; B.Sc.(Guelph), Ph.D.(McG.)

Joseph Shuster; B.Sc.(McG.), Ph.D.(Calif.), M.D.(Alta.)

John R. Silvius; B.Sc., Ph.D.(Alta.)

Nahum Sonenberg; M.Sc., Ph.D.(Weizmann Inst.), F.R.S.C., F.R.S. (*James McGill Professor*)

David Y. Thomas; B.Sc.(Brist.), M.Sc., Ph.D.(Univ. College, Lond.), F.R.S.C. (*Canada Research Chair in Molecular Genetics*)

Michel L. Tremblay; B.Sc., M.Sc.(Sher.), Ph.D.(McM.), F.R.S.C. (*Jeanne & Jean-Louis Levesque Chair in Cancer Research*)

Maria Zannis-Hadjopoulos; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Oncology & Medicine*)

Associate Professors

Maxime Bouchard; B.Sc., Ph.D.(Laval) (*Canada Research Chair in Developmental Genetics*)

Imed Gallouzi; Maitrise, D.E.A., Ph.D.(Montpellier, France) (*Canada Research Chair in Cellular Information Systems*)

Bhushan Nagar; B.Sc., Ph.D.(Tor.) (*Canada Research Chair in the Structural Biology of Signal Transduction*)

Arnim Pause; B.Sc., M.Sc.(U. Konstanz, Germ.), Ph.D.(McG.) (*Canada Research Chair in Molecular Oncology*)

Jason C. Young; B.Sc.(Tor.), Ph.D.(McM.) (*Canada Research Chair in Molecular Chaperones*)

Assistant Professors

Josée Dostie; B.Sc.(Sher.), Ph.D.(McG.) (*CIHR New Investigators Award; Chercheur Boursier du FRSQ*)

Thomas Duchaine; B.Sc., Ph.D.(Montr.) (*Chercheur Boursier du FRSQ*)

Martin Schmeing; B.Sc.(McG.), Ph.D.(Yale)

Julie St-Pierre; B.Sc., M.Sc.(Laval), Ph.D.(Camb.)

Jose G. Teodoro; B.Sc.(W. Ont.), Ph.D.(McG.) (*CIHR New Investigators Award; Chercheur Boursier du FRSQ*)

Associate Members

Karine Auclair (*Chemistry*), Jacques Genest (*Dept. of Medicine*), Matthias Götte (*Micro. & Immunol.*), Michael Hallett (*McGill Centre for Bioinformatics*), Qutayba Hamid (*Meakins-Christie Labs*), Robert S. Kiss (*Dept. of Medicine*), Gregory Miller (*Pharm. & Therapeutics*), Vassilios Papadopoulos (*Dept. of Medicine*), Janusz Rak (*Mtl. Children's Hospital*), Reza Salavati (*Inst. of Parasitology*), Maya Saleh (*Dept. of Medicine*), Erwin Schurr (*Ctr. For Host Resistance, MGH*), Charles Scriver (*Pediatrics, MCH*), Peter Siegel (*Dept. of Medicine*), Youla S. Tsantrizos (*Dept. of Chemistry*), Bernard Turcotte (*Dept. of Medicine, Goodman Cancer Ctr.*), Simon Wing (*Dept. of Medicine*), Xiang-Jiao Yang (*Mol. Oncol., RVH*)

Adjunct Professors

Mirek Cygler (*NRC/BRI*), Jacques Drouin (*Clin. Res. Inst.*), Anny Fortin (*Dafra Pharma Res. & Deve. Bvba*), Tarik Möröy (*IRCM*), Donald Nicholson (*Merck Frosst*), Maureen O'Connor (*NRC/BRI*), Enrico Purisima (*NRC/BRI*), René Roy (*PharmaQAM*), Alex Therien (*Merck Frosst Canada*)

11.2.5 Master of Science (M.Sc.); Biochemistry (Thesis) (45 credits)**Thesis Courses (36 credits)**

BIOC 697	(9)	Thesis Research 1
BIOC 698	(12)	Thesis Research 2
BIOC 699	(15)	Thesis Research 3

Required Course (3 credits)

BIOC 696	(3)	Seminars in Biochemistry
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Complementary Courses* (6 credits)

At least 3 credits must be chosen from the following:

BIOC 570	(3)	Biochemistry of Lipoproteins
BIOC 600	(3)	Advanced Strategies in Genetics and Genomics
BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
BIOC 605	(3)	Structural Biology and Proteomics
EXMD 615	(3)	Essentials of Glycobiology
EXMD 635D1	(3)	Experimental/Clinical Oncology
EXMD 635D2	(3)	Experimental/Clinical Oncology

Plus additional credits, to a minimum of 6 total complementary course credits, of 500- or higher-level courses in biomedical and allied sciences.

* Complementary courses are chosen in consultation with the Research Director.

The Graduate Advisory Committee may stipulate additional coursework depending on the background of the candidate. BIOC 450 (Protein Structure and Function) and BIOC 454 (Nucleic Acids) are additional requirements for those who have not previously completed equivalent courses in their prior training.

11.2.6 Master of Science (M.Sc.); Biochemistry (Thesis) — Chemical Biology (47 credits)**Thesis Courses (33 credits)**

BIOC 695	(6)	Thesis Research 1 (Chemical - Biology)
BIOC 698	(12)	Thesis Research 2
BIOC 699	(15)	Thesis Research 3

Required Course (3 credits)

BIOC 696	(3)	Seminars in Biochemistry
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Complementary Courses* (11 credits)

Two of the following courses:

BIOC 610	(1)	Seminars in Chemical Biology 1
BIOC 611	(1)	Seminars in Chemical Biology 3
BIOC 689	(1)	Seminars in Chemical Biology 2

BIOC 690 (1) Seminars in Chemical Biology 4

At least 3 credits from the following:

CHEM 502 (3) Advanced Bio-Organic Chemistry
CHEM 503 (3) Drug Design and Development 1
PHAR 503 (3) Drug Discovery and Development 1

and at least 3 credits from the following:

BIOC 570 (3) Biochemistry of Lipoproteins
BIOC 600 (3) Advanced Strategies in Genetics and Genomics
BIOC 603 (3) Genomics and Gene Expression
BIOC 604 (3) Macromolecular Structure
BIOC 605 (3) Structural Biology and Proteomics
EXMD 615 (3) Essentials of Glycobiology
EXMD 635D1 (3) Experimental/Clinical Oncology
EXMD 635D2 (3) Experimental/Clinical Oncology

Plus additional credits, to a total of at least 11 complementary course credits from the following list:

CHEM 504 (3) Drug Design and Development 2
CHEM 522 (3) Stereochemistry
CHEM 582 (3) Supramolecular Chemistry
CHEM 591 (3) Bioinorganic Chemistry
CHEM 621 (5) Reaction Mechanisms in Organic Chemistry
CHEM 629 (5) Organic Synthesis
CHEM 655 (4) Advanced NMR Spectroscopy
EXMD 510 (3) Bioanalytical Separation Methods
EXMD 602 (3) Techniques in Molecular Genetics
PHAR 504 (3) Drug Discovery and Development 2
PHAR 562 (3) General Pharmacology 1
PHAR 563 (3) General Pharmacology 2
PHAR 707 (3) Topics in Pharmacology 6

* Complementary courses are chosen in consultation with the Research Director.

The Graduate Advisory Committee may stipulate additional coursework depending on the background of the candidate. BIOC 450 (Protein Structure and Function) and BIOC 454 (Nucleic Acids) are additional requirements for those who have not previously completed equivalent courses in their prior training.

11.2.7 Master of Science (M.Sc.); Biochemistry (Thesis) — Bioinformatics (45 credits)

Thesis Courses (30 credits)

BIOC 694 (3) Thesis Research 4
BIOC 698 (12) Thesis Research 2
BIOC 699 (15) Thesis Research 3

Required Courses (6 credits)

BIOC 696	(3)	Seminars in Biochemistry
COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar

Complementary Courses* (9 credits)

3 credits to be chosen from the following courses:

BIOC 570	(3)	Biochemistry of Lipoproteins
BIOC 600	(3)	Advanced Strategies in Genetics and Genomics
BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
BIOC 605	(3)	Structural Biology and Proteomics
EXMD 615	(3)	Essentials of Glycobiology
EXMD 635D1	(3)	Experimental/Clinical Oncology
EXMD 635D2	(3)	Experimental/Clinical Oncology

Plus 6 credits from the following courses:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics
PHGY 603	(3)	Systems Biology and Biophysics

* Complementary courses are chosen in consultation with the Research Director.

The Graduate Advisory Committee may stipulate additional coursework depending on the background of the candidate. BIOC 450 (Protein Structure and Function) and BIOC 454 (Nucleic Acids) are additional requirements for those who have not previously completed equivalent courses in their prior training.

11.2.8 Doctor of Philosophy (Ph.D.); Biochemistry**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (3 credits)

BIOC 696*	(3)	Seminars in Biochemistry
BIOC 701**	(0)	Research Seminar 1
BIOC 702**	(0)	Ph.D. Thesis Proposal
BIOC 703**	(0)	Research Seminar 2

*Students promoted directly from the M.Sc. to the Ph.D. program, and who registered for and passed BIOC 696 at the M.Sc. level, do not register for BIOC 696 at the Ph.D. level.

** NOTE: Students DO NOT register for these courses until notified by the Student Affairs Officer.

Students must complete BIOC 701 in the third term after admission to the program, BIOC 702 in the fifth or sixth term, and BIOC 703 approximately six months prior to submission of the Ph.D. thesis.

Complementary Courses*** (6 credits)

At least 3 credits selected from:

BIOC 570	(3)	Biochemistry of Lipoproteins
BIOC 600	(3)	Advanced Strategies in Genetics and Genomics
BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
BIOC 605	(3)	Structural Biology and Proteomics
EXMD 615	(3)	Essentials of Glycobiology
EXMD 635D1	(3)	Experimental/Clinical Oncology
EXMD 635D2	(3)	Experimental/Clinical Oncology

Plus additional credits to a minimum of 6 total complementary course credits of 500- or higher-level courses in the biomedical and allied sciences.

*** Complementary courses are chosen in consultation with the Research Director.

The Graduate Advisory Committee may stipulate additional course work depending on the background of the candidate. BIOC 450 (Protein Structure and Function) and BIOC 454 (Nucleic Acids) are additional requirements for those who have not previously completed equivalent courses in their prior training.

11.2.9 Doctor of Philosophy (Ph.D.); Biochemistry — Chemical Biology

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (7 credits)

BIOC 610	(1)	Seminars in Chemical Biology 1
BIOC 611	(1)	Seminars in Chemical Biology 3
BIOC 689	(1)	Seminars in Chemical Biology 2
BIOC 690	(1)	Seminars in Chemical Biology 4
BIOC 696*	(3)	Seminars in Biochemistry
BIOC 701**	(0)	Research Seminar 1
BIOC 702**	(0)	Ph.D. Thesis Proposal
BIOC 703**	(0)	Research Seminar 2

* Students promoted directly from the M.Sc. to the Ph.D. program, and who registered for and passed BIOC 696 at the M.Sc. level, do not register for BIOC 696 at the Ph.D. level.

** NOTE: Students DO NOT register for these courses until notified by the Student Affairs Officer.

Students must complete BIOC 701 in the third term after admission to the program, BIOC 702 in the fifth or sixth term, and BIOC 703 approximately six months prior to submission of the Ph.D. thesis.

Complementary Courses*** (9 credits)

At least 3 credits from the following:

CHEM 502	(3)	Advanced Bio-Organic Chemistry
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CHEM 503	(3)	Drug Design and Development 1
PHAR 503	(3)	Drug Discovery and Development 1

At least 3 credits from the following:

BIOC 570	(3)	Biochemistry of Lipoproteins
BIOC 600	(3)	Advanced Strategies in Genetics and Genomics
BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
BIOC 605	(3)	Structural Biology and Proteomics
EXMD 615	(3)	Essentials of Glycobiology
EXMD 635D1	(3)	Experimental/Clinical Oncology
EXMD 635D2	(3)	Experimental/Clinical Oncology

Plus additional credits to a total of at least 9 complementary course credits from the following list:

CHEM 504	(3)	Drug Design and Development 2
CHEM 522	(3)	Stereochemistry
CHEM 582	(3)	Supramolecular Chemistry
CHEM 591	(3)	Bioinorganic Chemistry
CHEM 621	(5)	Reaction Mechanisms in Organic Chemistry
CHEM 629	(5)	Organic Synthesis
CHEM 655	(4)	Advanced NMR Spectroscopy
EXMD 510	(3)	Bioanalytical Separation Methods
EXMD 602	(3)	Techniques in Molecular Genetics
PHAR 504	(3)	Drug Discovery and Development 2
PHAR 562	(3)	General Pharmacology 1
PHAR 563	(3)	General Pharmacology 2
PHAR 707	(3)	Topics in Pharmacology 6

*** Complementary courses are chosen in consultation with the Research Director.

The Graduate Advisory Committee may stipulate additional coursework depending on the background of the candidate. BIOC 450 (Protein Structure and Function) and BIOC 454 (Nucleic Acids) are additional requirements for those who have not previously completed equivalent courses in their prior training.

11.2.10 Doctor of Philosophy (Ph.D.); Biochemistry — Bioinformatics

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (6 credits)

BIOC 696*	(3)	Seminars in Biochemistry
BIOC 701**	(0)	Research Seminar 1
BIOC 702**	(0)	Ph.D. Thesis Proposal

BIOC 703**	(0)	Research Seminar 2
COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar

* Students promoted directly from the M.Sc. to the Ph.D. program, and who registered for and passed BIOC 696 at the M.Sc. level, do not register for BIOC 696 at the Ph.D. level.

** NOTE: Students DO NOT register for these courses until notified by the Student Affairs Officer.

Students must complete BIOC 701 in the third term after admission to the program, BIOC 702 in the fifth or sixth term, and BIOC 703 approximately six months prior to submission of the Ph.D. thesis.

Complementary Courses* (9 credits)**

3 credits from the following:

BIOC 570	(3)	Biochemistry of Lipoproteins
BIOC 600	(3)	Advanced Strategies in Genetics and Genomics
BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
BIOC 605	(3)	Structural Biology and Proteomics
EXMD 615	(3)	Essentials of Glycobiology
EXMD 635D1	(3)	Experimental/Clinical Oncology
EXMD 635D2	(3)	Experimental/Clinical Oncology

Plus 6 credits from the following:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics
PHGY 603	(3)	Systems Biology and Biophysics

*** Complementary courses are chosen in consultation with the Research Director.

The Graduate Advisory Committee may stipulate additional coursework depending on the background of the candidate. BIOC 450 (Protein Structure and Function) and BIOC 454 (Nucleic Acids) are additional requirements for those who have not previously completed equivalent courses in their prior training.

11.3 Bioethics

11.3.1 Location

For information, write to:

Jennifer Fishman, Graduate Program Director
Biomedical Ethics Unit
3647 Peel Street
Montreal, QC H3A 1X1
Canada

Telephone: 514-398-6980

Fax: 514-398-8349

Website: www.mcgill.ca/biomedicalethicsunit/masters

11.3.2 About Bioethics

The Biomedical Ethics Unit was established in 1996 with the aim of supporting scholarly research, clinical services, teaching, and public outreach. Members of the unit have backgrounds in anthropology, history, law, medicine, molecular genetics, philosophy, and sociology. We offer a master's degree specialization in biomedical ethics for selected master's students in the Division of Experimental Medicine, Genetics Department, Philosophy Department, Faculty of Religious Studies, and Faculty of Law.

Master's Specialization in Bioethics

The Master's Specialization in Bioethics is sponsored by the:

Faculty of Medicine, Division of Experimental Medicine;
Faculty of Law;
Faculty of Religious Studies; and
Faculty of Arts, Department of Philosophy.

Students receive an M.A., LL.M., or M.Sc. degree in the discipline chosen with a specialization in Bioethics.

Students pursuing the master's degree specialization normally take two semesters of courses before beginning their master's thesis. Courses offered include Bioethics Theory, Public Health Ethics and Policy, Research Ethics, and a Practicum that includes placement in a clinical or research setting. Research and writing the thesis normally takes one year. Students must also comply with the course and thesis requirements of their home disciplines.

11.3.3 Bioethics Admission Requirements and Application Procedures

11.3.3.1 Admission Requirements

Revision, October 2012. Start of revision.

M.D., bachelor's-level professional training in a health science, or bachelor's degree in law, philosophy, or religious studies. Other students may be considered on an individual basis.

Enrolment is limited to 12 students.

11.3.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

Applications for the Master's Specialization in Bioethics are made initially through the Faculties of Law, Medicine (Division of Experimental Medicine), Religious Studies, and the Department of Philosophy.

Applicants must satisfy the admission criteria for their chosen discipline and those of the Bioethics Unit, which administers the program and teaches the core courses (www.mcgill.ca/biomedicalethicsunit/masters/apply). Once you have completed your online application, send an email to heike.farber@mcgill.ca at the Bioethics Unit stating your chosen base discipline.

Applicants must be accepted by the appropriate Faculty, the Bioethics Graduate Studies Advisory Committee, and Graduate and Postdoctoral Studies.

11.3.3.3 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: Jan. 15	Fall: Jan. 15	Fall: Jan. 15
Winter: N/A	Winter: N/A	Winter: N/A
Summer: N/A	Summer: N/A	Summer: N/A

Revision, October 2012. End of revision.

11.3.4 Bioethics Faculty

Faculty

E. Bereza; B.A., M.D., C.M.(McG.), C.C.F.P.(C)
A. Campbell; B.A., LL.B., B.C.L.(McG.), LL.M.(Harv.)
C. Ells; R.R.T.(VGH), B.A.(St. Mary's), M.A., Ph.D.(Tenn.)
J.R. Fishman; B.A.(Calif., Berk.), Ph.D.(Calif., SF)
K.C. Glass; A.M.(Chic.), LL.B., B.C.L., D.C.L.(McG.)

Faculty

J. Kimmelman; B.S.(Duke), Ph.D.(Yale)

N.B. King; B.A.(Penn.), M.A., Ph.D.(Harv.)

11.4 Biomedical Engineering**11.4.1 Location**

Department of Biomedical Engineering
 Duff Medical Building
 3775 University Street, Room 316
 Montreal, QC H3A 2B4
 Canada

Telephone: 514-398-6736

Fax: 514-398-7461

Website: www.mcgill.ca/bme**11.4.2 About Biomedical Engineering**

The Department offers graduate training programs leading to master's (M.Eng.) and Ph.D. degrees in Biomedical Engineering.

We provide instruction and opportunities for interdisciplinary research in the application of engineering, mathematics, and the physical sciences to problems in medicine and the life sciences. Courses are offered for graduate students in the life sciences, engineering, and the physical sciences.

Excellent laboratory facilities for basic and applied research are available in the Department and in the laboratories of associated staff located elsewhere on campus. The Department operates a network of high-performance workstations and well-equipped mechanical and electronics workshops.

Basic research in the Department concentrates on the application of quantitative engineering analysis methods to basic biomedical research problems. Currently active areas of research include: neuromuscular and postural control, muscle mechanics, the vestibular system, oculomotor control, the auditory system, joint prosthetics, biomaterials, artificial cells and organs, cell and tissue engineering, drug delivery, probiotics, functional food and nutraceuticals, medical imaging, microfluidics, nanotechnology, and bioinformatics in genomics and proteomics. Staff members are also active in more applied research related to the development of quantitative analysis tools and instruments for biomedical research. Areas of activity here include: signal analysis, system identification, modelling, simulation and parameter estimation, image processing, pattern recognition, ultrasound, and biorobotics. A new option in bioinformatics is offered jointly with other University departments.

Graduate students may also be registered through the departments of Medicine, Science, and Engineering, and must then fulfil the requirements for advanced degrees imposed by their respective departments.

In addition, all students are required, through coursework and independent study, to achieve a degree of interdisciplinary competence appropriate to their area of specialization.

M.Eng. Meetings: 1) Initial; 2) Progress; and Fast-Track transfer to the Ph.D. program. Details of each meeting can be found at: www.mcgill.ca/bme/students/policies-forms.

Ph.D. Meetings: 1) Preliminary; 2) Comprehensive Exam Preparation; 3) Thesis Proposal and Comprehensive Exam; 4) Thesis Progress; and 5) Thesis Pre-submission. Details of each meeting can be found at: www.mcgill.ca/bme/students/policies-forms.

section 11.4.5: Master of Engineering (M.Eng.); Biomedical Engineering (Thesis) (45 credits)

In the first Biomedical Engineering (BME) department in Canada, BME internationally renowned staff provide frequent and stimulating interactions with physicians, scientists in many fields, and with the biomedical industry. McGill BME provides opportunities to receive training in a unique multidisciplinary environment, taking advantage of research collaborations between staff in the Faculties of Medicine, Science, and Engineering. BME offers only thesis-based graduate degrees (M.Eng.) spanning broad themes in biomodelling, biosignal processing, medical imaging, nanotechnology, artificial cells and organs, probiotics, bioinformatics, bioengineering, biomaterials, and orthopaedics. For details, please refer to the BME website: www.mcgill.ca/bme. The best preparation is with a bachelor's degree in engineering, science, or medicine with a strong emphasis on mathematics, physics, chemistry, and basic physiology, or cell biology. BME graduates have secured positions in academia, biomedical and other industries, and government or regulatory sectors. To our knowledge, all of our graduates have secured suitable employment either before or within a few months of graduation.

section 11.4.6: Master of Engineering (M.Eng.); Biomedical Engineering (Thesis) — Bioinformatics (45 credits)

Bioinformatics research lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. The intention of the Bioinformatics Option is to train M.Eng. students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyze datasets, the application of modelling techniques, the creation of tools for manipulating Bioinformatics data, the integration of biological databases, and the use of algorithms and statistics. Students successfully completing the Bioinformatics Option will be

section 11.4.6: Master of Engineering (M.Eng.); Biomedical Engineering (Thesis) — Bioinformatics (45 credits)

fluent in the concepts, language, approaches, and limitations of the field. The option consists of a number of interdisciplinary courses and a seminar designed to bring students from many backgrounds together and to provide a thorough overview of research in this field.

section 11.4.7: Doctor of Philosophy (Ph.D.); Biomedical Engineering

In the first Biomedical Engineering (BME) department in Canada, BME internationally renowned staff provide frequent and stimulating interactions with physicians, scientists in many fields and with the biomedical industry. McGill BME provides opportunities to receive training in a unique multidisciplinary environment, taking advantage of research collaborations between staff in the Faculties of Medicine, Science, and Engineering. BME offers only thesis-based graduate degrees (Ph.D.) spanning broad themes in biomodelling, biosignal processing, medical imaging, nanotechnology, artificial cells and organs, probiotics, bioinformatics, bioengineering, biomaterials, and orthopaedics. For details, please refer to the BME website: www.mcgill.ca/bme. The best preparation is with a bachelor's degree in engineering, science, or medicine and a master's degree in biomedical engineering, bioengineering, biotechnology, electrical engineering, physiology, chemical engineering, biomaterial, system engineering, imaging, or other related areas. BME graduates have secured positions in academia, biomedical, and other industries, and government or regulatory sectors. To our knowledge, all of our graduates have secured suitable employment either before or within a few months of graduation.

section 11.4.8: Doctor of Philosophy (Ph.D.); Biomedical Engineering — Bioinformatics

Bioinformatics research lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. The intention of the Bioinformatics Option is to train Ph.D. students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyze datasets, the application of modelling techniques, the creation of tools for manipulating Bioinformatics data, the integration of biological databases and the use of algorithms and statistics. Students successfully completing the Bioinformatics Option will be fluent in the concepts, language, approaches, and limitations of the field, and will be capable of developing an independent Bioinformatics research program. The option consists of a number of interdisciplinary courses and a seminar designed to bring students from many backgrounds together and to provide a thorough overview of research in this field.

11.4.3 Biomedical Engineering Admission Requirements and Application Procedures**11.4.3.1 Admission Requirements**

Revision, October 2012. Start of revision.

See [section 6.2: Admission Requirements \(minimum requirements to be considered for admission\)](#). In addition, please see the Department website: www.mcgill.ca/bme.

11.4.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

Please address enquiries directly to the Department.

11.4.3.3 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: March 15	Fall: March 15	Fall: March 15
Winter: Oct. 15	Winter: Sept. 15	Winter: Same as Canadian/International
Summer: N/A	Summer: N/A	Summer: N/A



Note: We are not willing to consider any applications to be admitted for the Summer term.

Revision, October 2012. End of revision.

11.4.4 Biomedical Engineering Faculty**Chair**

H.L. Galiana

Emeritus Professor

T.M.S. Chang; B.Sc., M.D., C.M., Ph.D.(McG.), F.R.C.P.(C) F.R.S.(C) (joint appt. with Physiology)

Professors

J.D. Bobyn; B.Sc., M.Sc.(McG.), Ph.D.(Tor.) (*joint appt. with Surgery*)
 D.L. Collins; B.Sc., M.Eng., Ph.D.(McG.) (*joint appt. with Neurology and Neurosurgery*)
 A.C. Evans; B.Sc.(Liv.), M.Sc.(Sur.), Ph.D.(Leeds) (*joint appt. with Neurology and Neurosurgery*)
 H.L. Galiana; B.Eng., M.Eng., Ph.D.(McG.)
 R.E. Kearney; B.Eng., M.Eng., Ph.D.(McG.)
 G.B. Pike; B.Eng., M.Eng., Ph.D.(McG.) (*joint appt. with Neurology and Neurosurgery*)
 S. Prakash; B.Sc.(Hon.), M.Sc., M.Tech.(BHU), Ph.D.(McG.)
 M. Tabrizian; B.Sc.(Iran), M.Sc., Ph.D.(PMC-France), M.B.A.(HEC) (*joint appt. with Dentistry*)

Associate Professors

W.R.J. Funnell; B.Eng., M.Eng., Ph.D.(McG.) (*joint appt. with Otolaryngology*)
 D. Juncker; Dipl., Ph.D.(Neuch-Switzerland)
 J.L. Nadeau; B.A., Ph.D.(Minn.)

Assistant Professor

C. Grova; B.Sc. M.Sc.(UTC-France), Ph.D.(Rennes)

Associate Members

S. Baillet (*Neurology and Neurosurgery*), C. Baker (*Ophthalmology*), F. Barthelat (*Mechanical Engineering*), K. Cullen (*Physiology*), I. El Naqa (*Oncology*), J. Gotman (*Neurology and Neurosurgery*), D. Guitton (*Neurology and Neurosurgery*), E. Jones (*Chemical Engineering*), A. Katsarkas (*Otolaryngology*), A.M. Lauzon (*Medicine*), R. Leask (*Chemical Engineering*), T. Milner (*Kinesiology & Physical Education*), L. Mongeau (*Mechanical Engineering*), R. Mongrain (*Mechanical Engineering*), A. Reader (*Neurology and Neurosurgery*), A. Shmuel (*Neurology and Neurosurgery*)

Adjunct Professors

P.G. Charette (Sher.), J.-M. Lina (ETS), T. Veres (NRC)

11.4.5 Master of Engineering (M.Eng.); Biomedical Engineering (Thesis) (45 credits)**Thesis Courses (24 credits)**

BMDE 695	(12)	Thesis Submission
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12 credits selected from the following courses:

BMDE 690	(3)	Thesis Research 1
BMDE 691	(3)	Thesis Research 2
BMDE 692	(3)	Thesis Research 3
BMDE 693	(6)	Thesis Research 4
BMDE 694	(6)	Thesis Research 5

Complementary Courses (21 credits)

12 credits of courses which have both biomedical content and content from the physical sciences, engineering, or computer science selected from the following:

BIOT 505	(3)	Selected Topics in Biotechnology
BMDE 500D1	(1.5)	Seminars in Biomedical Engineering
BMDE 500D2	(1.5)	Seminars in Biomedical Engineering
BMDE 501	(3)	Selected Topics in Biomedical Engineering

BMDE 502	(3)	BME Modelling and Identification
BMDE 503	(3)	Biomedical Instrumentation
BMDE 504	(3)	Biomaterials and Bioperformance
BMDE 505	(3)	Cell and Tissue Engineering
BMDE 506	(3)	Molecular Biology Techniques
BMDE 508	(3)	Introduction to Micro and Nano-Bioengineering
BMDE 519	(3)	Biomedical Signals and Systems
BMDE 650	(3)	Advanced Medical Imaging
BMDE 651	(3)	Orthopaedic Engineering
BMDE 652	(3)	Bioinformatics: Proteomics
COMP 526	(3)	Probabilistic Reasoning and AI
COMP 558	(3)	Fundamentals of Computer Vision
COMP 646	(4)	Computational Perception
COMP 761	(4)	Advanced Topics Theory 2
ECSE 523	(3)	Speech Communications
ECSE 526	(3)	Artificial Intelligence
ECSE 529	(3)	Computer and Biological Vision
ECSE 626	(4)	Statistical Computer Vision
ECSE 681	(4)	Colloquium in Electrical Engineering
EXMD 610	(3)	Molecular Methods in Medical Research
MDPH 607	(3)	Introduction to Medical Imaging
MDPH 611	(2)	Medical Electronics
MDPH 612	(2)	Computers in Medical Imaging
MECH 500	(3)	Selected Topics in Mechanical Engineering
MECH 561	(3)	Biomechanics of Musculoskeletal Systems
PHGY 517	(3)	Artificial Internal Organs
PHGY 518	(3)	Artificial Cells

or, with the approval of the student's Graduate Advisory Committee and the Graduate Program Chair, other graduate-level courses with content of interest to biomedical engineering students.

9 credits selected from the courses listed above, or with approval of the Graduate Chair and Supervisor.

11.4.6 Master of Engineering (M.Eng.); Biomedical Engineering (Thesis) — Bioinformatics (45 credits)

Thesis Courses (24 credits)

BMDE 693	(6)	Thesis Research 4
BMDE 694	(6)	Thesis Research 5
BMDE 695	(12)	Thesis Submission

Required Courses (3 credits)

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar

Complementary Courses (18 credits)

12 credits of courses which have both biomedical content and content from the physical sciences, engineering, or computer science selected from the following:

BIOT 505	(3)	Selected Topics in Biotechnology
BMDE 500D1	(1.5)	Seminars in Biomedical Engineering
BMDE 500D2	(1.5)	Seminars in Biomedical Engineering
BMDE 501	(3)	Selected Topics in Biomedical Engineering
BMDE 502	(3)	BME Modelling and Identification
BMDE 503	(3)	Biomedical Instrumentation
BMDE 504	(3)	Biomaterials and Bioperformance
BMDE 505	(3)	Cell and Tissue Engineering
BMDE 506	(3)	Molecular Biology Techniques
BMDE 508	(3)	Introduction to Micro and Nano-Bioengineering
BMDE 519	(3)	Biomedical Signals and Systems
BMDE 650	(3)	Advanced Medical Imaging
BMDE 651	(3)	Orthopaedic Engineering
COMP 526	(3)	Probabilistic Reasoning and AI
COMP 558	(3)	Fundamentals of Computer Vision
COMP 646	(4)	Computational Perception
COMP 761	(4)	Advanced Topics Theory 2
ECSE 523	(3)	Speech Communications
ECSE 526	(3)	Artificial Intelligence
ECSE 529	(3)	Computer and Biological Vision
ECSE 626	(4)	Statistical Computer Vision
ECSE 681	(4)	Colloquium in Electrical Engineering
EXMD 610	(3)	Molecular Methods in Medical Research
MDPH 607	(3)	Introduction to Medical Imaging
MDPH 611	(2)	Medical Electronics
MDPH 612	(2)	Computers in Medical Imaging
MECH 500	(3)	Selected Topics in Mechanical Engineering
MECH 561	(3)	Biomechanics of Musculoskeletal Systems
PHGY 517	(3)	Artificial Internal Organs
PHGY 518	(3)	Artificial Cells

6 credits selected from the following courses:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics
PHGY 603	(3)	Systems Biology and Biophysics

In addition, students are required to present their work as a conference paper or departmental seminar before being granted the M.Eng. (Bioinformatics Option) degree.

11.4.7 Doctor of Philosophy (Ph.D.); Biomedical Engineering**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Course

BMDE 700	(0)	Ph.D. Comprehensive
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Students must be registered in the course at the time of the Thesis Proposal and Comprehensive Exam Meeting.

11.4.8 Doctor of Philosophy (Ph.D.); Biomedical Engineering — Bioinformatics**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (3 credits)

BMDE 700	(0)	Ph.D. Comprehensive
COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar

Any additional coursework required will be determined on an individual basis by the student's adviser and the Graduate Program Director.

Complementary Courses (6 credits)

6 credits from the following:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics
PHGY 603	(3)	Systems Biology and Biophysics

11.5 Communication Sciences and Disorders**11.5.1 Location**

School of Communication Sciences and Disorders
Beatty Hall
1266 Pine Avenue West
Montreal, QC H3G 1A8
Canada

Telephone: 514-398-4137
Fax: 514-398-8123
Email: scsd@mcgill.ca
Website: www.mcgill.ca/scsd

11.5.2 About Communication Sciences and Disorders

The School provides both professional and research training in communication sciences and disorders at the graduate level through its M.Sc. (Applied), M.Sc., and Ph.D. degrees. We were the first department in Canada to provide both clinical and research degrees. Our M.Sc.A. program aims to educate the next generation of well-prepared and innovative speech-language pathology professionals by providing enriched classroom training, clinical laboratory activities that enhance the transition from theory to practice, and outstanding clinical practicum experiences. Our research degrees are designed to develop leading researchers and scholars, who will go on to train future investigators in the field of communication sciences and disorders and who, through their research, will advance our understanding of the processes of human communication and its breakdown. Interdisciplinary interactions are at the core of our research training approach, which includes preparation to conduct both fundamental and clinically applied investigations. Our professors have collaborative ties with many departments and institutes of McGill (psychology, linguistics, neuroscience, otolaryngology, biomedical engineering, Montreal Neurological Institute and Hospital) as well as other Montreal universities, and they maintain national and international collaborations. Students can access this rich collaborative network via the McGill Centre for Research on Brain, Language and Music, a world-class interdisciplinary research centre established and directed by the School. The multilingual context in which we reside provides a unique environment for language research.

The School offers a professional degree in Communication Sciences and Disorders at the M.Sc. (Applied) level with specialization in Speech Language Pathology and two research degrees: an M.Sc. (Research) and a Ph.D. in Communication Sciences and Disorders.

Requirements for Licensure

The majority of provinces in Canada and certain states in the U.S. require that those intending to practise as speech-language pathologists within their borders comply with special provincial or state licensing regulations. Graduates wishing to practise in the province of Quebec must be members of the *Ordre des Orthophonistes et Audiologistes du Québec* (OOAQ) in order to call themselves speech-language pathologists. Further information is available from the OOAQ, 235 boulevard René Lévesque est, bureau 601, Montreal, Quebec, H2X 1N8. Telephone: 514-282-9123. Website: www.ooaq.qc.ca.

Quebec law requires that candidates seeking licensure in provincially recognized professions demonstrate a verbal and written working knowledge of the French language. See the *Language Requirements for Professions* in the *General University Information and Regulations* section of the *Health Sciences Calendar* available at www.mcgill.ca/study.

Funding

The IODE Provincial Chapter of Quebec funds two \$1,000 “Silence to Sound” awards for studies in hearing impairment. These in-course awards are based on academic merit, financial need, and potential for excellence, and are awarded by the School.

Montreal League for the Hard of Hearing Award – Candidates must be enrolled at the graduate level in the School and working in the area of hearing impairment. Awarded by the School. Value: up to \$1,000.

section 11.5.5: Master of Science, Applied (M.Sc.A.); Communication Sciences & Disorders (Non-Thesis) — Speech-Language Pathology (69 credits)

The professional degree leads to a Master of Science (Applied) with a specialization in Speech Language Pathology. The program involves two academic years of full-time study and related practical work followed by a Summer internship. To prepare students as creative professionals, the program emphasizes the understanding of principles and theories, and their present or potential clinical applications, in addition to the teaching of specific techniques for assessment and intervention. Active participation in the learning process is encouraged.

The profession of speech-language pathology concerns assessment and intervention in speech and language disorders. In particular, the speech-language pathologist is concerned with two major parameters of communication sciences and disorders: language and speech. At present, most speech-language pathologists in Canada work in hospitals, public school systems, rehabilitation centres, and in special education facilities.

Students pursuing the M.Sc.A. complete the basic academic content and clinical practica required in preparation for clinical practice as outlined by CASLPA (Canadian Association of Speech Language Pathologist and Audiologists). Our M.Sc.A. program is completed in two years whereas some other programs require three years to complete. The emphasis on bridging theory and clinical practice is very strong in our program. Our admission requirements emphasize basic sciences and do not require completion of a specific undergraduate degree. This flexible entry accommodates students with undergraduate degrees in different fields and promotes diversity within our student body. Our goal is to recruit and train skillful therapists and problem-solvers who can rely on strong foundation in theory to address challenging clinical issues. Our M.Sc.A. graduates typically pursue a professional career working in schools, hospitals, rehabilitation centres, or in private practices. A subset of our graduates will enter a doctoral program (immediately or after a period of clinical employment) to pursue a research career.

Research Degrees – M.Sc. and Ph.D.

section 11.5.6: Master of Science (M.Sc.); Communication Sciences and Disorders (Thesis) (45 credits)

Selected candidates may be accepted for the M.Sc. research degree. Each student's thesis supervisor and Thesis Committee design an individualized program of study in collaboration with the student. The program can include graduate courses offered by the School and by other departments at McGill.

This program is designed for students who wish to combine research training with their clinical (M.Sc.A.) program or students from related fields who wish to gain research experience in communication sciences to prepare for doctoral studies. Students are required to take two semesters (6 credits) of statistics and complete a thesis. Admission to the M.Sc. research program requires identification of an SCSA professor(s) with relevant expertise to mentor the student through the thesis process. Graduates of our M.Sc. research program follow diverse career paths working in clinical settings (if they also have a clinical degree) or settings that combine clinical and research activities or continuing their research training at the doctoral level.

section 11.5.7: Doctor of Philosophy (Ph.D.); Communication Sciences and Disorders

Selected candidates may be accepted for the Ph.D. research degree. Each student's thesis supervisor and Thesis Committee design an individualized program of study in collaboration with the student. The program can include graduate courses offered by the School and by other departments at McGill.

Students pursuing a Ph.D. in SCSD have varied educational backgrounds, including both clinical and related non-clinical fields. Students who enter the program from a related field (e.g., Psychology, Linguistics) or without a master's thesis complete a Qualifying year, which includes coursework and a research project. This flexible entry attracts independent scholars with diverse backgrounds and interests, which creates a stimulating and enriched training environment. The main component of the Ph.D. program (beyond the Qualifying year) has minimal required coursework and is structured to support students as they develop and pursue an innovative, individualized program of doctoral studies. Admission to the doctoral program requires identification of a SCSD professor(s) with relevant expertise to mentor the student in this process. Ph.D. students have the opportunity to pursue an interdisciplinary specialization in language acquisition through the McGill Language Acquisition Program, which intersects with McGill departments of Linguistics, Psychology, and Education. Our Ph.D. graduates typically pursue academic careers in universities or research institutes, but some work in settings that combine research and professional activities.

section 11.5.8: Doctor of Philosophy (Ph.D.); Communication Sciences and Disorders — Language Acquisition

Information about this option is available from the School and at www.psych.mcgill.ca/lap.html. This unique interdisciplinary Ph.D. program is available for doctoral students across four departments at McGill including SCSD, Linguistics, Psychology, and Integrated Studies in Education. The program is designed to provide enriched training focused on the scientific exploration of language acquisition by different kinds of learners in diverse contexts. Students in the Language Acquisition Program are introduced to theoretical and methodological issues on language acquisition from the perspectives of cognitive neuroscience, theoretical linguistics, psycholinguistics, education, communication sciences and disorders, and neuropsychology. In addition to the SCSD Ph.D. requirements, students in this program must complete 6 credits of coursework in language acquisition (including at least one course that is not in their home department), and four interdisciplinary seminars (2 credits each) and must include a faculty member in the Language Acquisition Program on their thesis committee.

11.5.3 Communication Sciences and Disorders Admission Requirements and Applications Procedures**11.5.3.1 Admission Requirements**

Revision, October 2012. Start of revision.

M.Sc. (Applied)

An applicant must hold an undergraduate degree with a minimum B average (3.0 on a 4.0-point scale) or better in areas relevant to the selected field of specialization. Specific requirements are 6 credits in statistics, a total of 18 credits across the disciplines of psychology and linguistics (with a minimum of 6 credits in each discipline). Knowledge of physiology is also desirable.

M.Sc. in Communication Sciences and Disorders

The M.Sc. provides research training for:

1. students who are also taking courses for professional qualification;
2. students who have a non-thesis professional degree in Communication Sciences and Disorders; and
3. students with degrees in related fields who wish to do research but not obtain professional qualification in Communication Sciences and Disorders.

Ph.D. in Communication Sciences and Disorders

Applicants should normally have a master's degree with thesis or its equivalent in Communication Sciences and Disorders or a related field (e.g., psychology, linguistics).

Students who possess an appropriate bachelor's degree or master's degree without thesis will also be considered for the Ph.D. program, but, if admitted, must first complete a Qualifying year of coursework and a research project.

Applicants to graduate studies whose mother tongue is not English and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit documented proof of competency in oral and written English **prior to admission**: the Test of English as a Foreign Language (TOEFL) with a minimum score of 587 (paper-based) or 95 on the Internet-based test with minimum component scores of 24 in both Speaking and Writing and 21 in both Reading and Listening, or the International English Language Testing System (IELTS) with a minimum overall band score of 7.0.

11.5.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

Please see the School of Communication Sciences and Disorders website at www.mcgill.ca/scsd/programs for required application materials.

M.Sc. (Thesis) and Ph.D. programs

All applications received by the Dates for Guaranteed Consideration are automatically considered for any internal funding or awards made available to the Department for recruitment purposes. Students who apply for Fall admission generally have the most options with respect to applying for external funding as well as for being considered for internal support.

11.5.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Prerequisite Form

Applications will be considered upon receipt of supporting documents as outlined above. All applicants are strongly encouraged to submit reports of their performance on the Graduate Record Examination (GRE).

11.5.3.3 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: Jan. 15	Fall: Jan. 15	Fall: Jan. 15
Winter: Sept. 15	Winter: Sept. 15	Winter: Sept. 15
Summer: N/A	Summer: N/A	Summer: N/A

Revision, October 2012. End of revision.

11.5.4 Communication Sciences and Disorders Faculty

Director and Associate Dean

Marc Pell

Research Director

Linda Polka

Emeritus Professor

Donald Doehring; B.A.(Buff.), M.A.(N.M.), Ph.D.(Ind.)

Professors

Shari Baum; B.A.(C'nell), M.S.(Vermont), M.A., Ph.D.(Brown)

Athanasios Katsarkas; M.D.(Thess.), M.Sc.(McG.), F.R.C.P.(C)

Marc Pell; B.A.(Ott.), M.Sc., Ph.D.(McG.)

Associate Professors

Vincent Gracco; B.A., M.A.(San Diego), Ph.D.(Wisc.-Madison)

Linda Polka; B.A.(Slippery Rock), M.A.(Minn.), Ph.D.(S. Flor.)

Susan Rvachew; B.Sc.(Alta.), M.Sc., Ph.D.(Calg.)

Karsten Steinhauer; M.Sc., Ph.D.(Dr.rer.nat)(Free Univ., Berlin)

Elin Thordardottir; B.A., M.Sc., Ph.D.(Wisc.-Madison)

Assistant Professors

Meghan Clayards; B.Sc.(Vic., BC), M.A., Ph.D.(Roch.)

Laura Gonnerman; B.A.(Boston), M.A.(Middlebury), Ph.D.(USC)

Aparna Nadig; B.A.(Reed), M.S., Ph.D.(Brown)

Assistant Professors (Part-Time)

Christina Lattermann; Staatlich anerkannte Logopaedin(Westfaelische Wilhelms-Universitaet, Muenster), M.Sc.(McG.), Ph.D.(Kassel)

Gabriel Leonard; B.A.(Dublin), D.A.P., M.Sc., Ph.D.(McG.)

Assistant Professors (Part-Time)

Rosalee Shenker; B.Sc.(Syrac.), M.A.(Calif. St.), Ph.D.(McG.)

Faculty Lecturer

Anne Vogt; B.Ed., B.A.(Tel Aviv), M.Sc.A.(McG.)

Faculty Lecturers (Part-Time)

Monique Bois; B.A., M.A., Ph.D.(Montr.), M.Sc.A.(Ott.)

Catherine Bosse; B.Ed.(Montr.), M.Sc.A.(McG.)

Francois-Xavier Brajot; B.A.(Georgia), M.Sc.(Pitt.)

Myrto Brandeker; M.Sc.(Karolinska Inst.)

Liliane Brunetti; B.Sc.(C'dia), M.Cl.Sc.(W. Ont.)

Henry Cheang; B.A.(C'dia), M.Sc., Ph.D.(McG.)

Patricia Coffin; B.A.(PEI), M.Sc.(Dal.)

Isabelle Deschamps; B.A.(McG)

Karen Evans; Licentiate(L.C.S.T.), M.A.(Car.), M.Sc.(McG.)

Ariana Fraid; B.A., M.Sc.A.(McG.)

Esther Lando; B.A.(Manit.), M.Sc.A.(McG.)

James Lapointe; B.A., M.Sc.A.(McG.)

Zinta Mateus; B.S.(Rutg.), B.Ed., M.Sc.A.(McG.)

Mariannne Paul; B.A.(UQAM), B.A., M.Sc.A., M.Sc.(McG.)

Judith Robillard-Shultz; B.A., M.Sc.A.(McG.)

Aruna Sudarshan; B.Sc., M.Sc.(Institute of Speech and Hearing, Bangalore)

Colleen Timm; B.A.(C'dia), M.Sc.A.(McG.)

Associate Members

Eva Kehayia (*Physical and Occupational Therapy*)

Yuriko Oshima-Takane (*Psychology*)

Adjunct Members

Howard Chertkow (*Jewish Gen.*), David McFarland (*Montr.*), Lucie Menard (*UQAM*)

11.5.5 Master of Science, Applied (M.Sc.A.); Communication Sciences & Disorders (Non-Thesis) — Speech-Language Pathology (69 credits)

The professional degree program involves two academic years of full-time study and related practical work followed by a Summer internship.

Required Courses (63 credits)

SCSD 609	(3)	Neuromotor Disorders
SCSD 616	(3)	Audiology
SCSD 617	(3)	Anatomy and Physiology: Speech and Hearing
SCSD 618	(3)	Research and Measurement Methodologies 1
SCSD 619	(3)	Phonological Development
SCSD 624	(3)	Language Processes
SCSD 631	(3)	Speech Science

SCSD 632	(3)	Phonological Disorders: Children
SCSD 633	(3)	Language Development
SCSD 636	(3)	Fluency Disorders
SCSD 637	(3)	Developmental Language Disorders 1
SCSD 638	(3)	Neurolinguistics
SCSD 639	(3)	Voice Disorders
SCSD 642	(3)	Aural Rehabilitation
SCSD 643	(3)	Developmental Language Disorders 2
SCSD 644	(3)	Applied Neurolinguistics
SCSD 646	(2)	Introductory Clinical Practicum
SCSD 669	(3)	ASD and Neurodevelopmental Disorders
SCSD 679	(2)	Advanced Clinical Practicum
SCSD 680	(3)	Deglutition and Dysphagia
SCSD 681	(1)	Practicum and Seminar 1
SCSD 682	(1)	Practicum and Seminar 2
SCSD 683	(1)	Practicum and Seminar 3
SCSD 684	(1)	Practicum and Seminar 4
SCSD 689	(1)	Management Cranio-Facial Disorders

Complementary Courses (6 credits)

Two of the following:

SCSD 634	(3)	Research and Measurement Methods 2
SCSD 664	(3)	Communication Sciences and Disorders 1
SCSD 666	(3)	Communication Sciences and Disorders 3
SCSD 667	(3)	Communication Sciences and Disorders 4
SCSD 670	(3)	Communication Sciences and Disorders 2
SCSD 678	(3)	Special Topics 4

11.5.6 Master of Science (M.Sc.); Communication Sciences and Disorders (Thesis) (45 credits)**Thesis Courses (24 credits)**

SCSD 671	(12)	M.Sc. Thesis 1
SCSD 672	(12)	M.Sc. Thesis 2

Complementary Courses (21 credits)

6-21 credits chosen from:

SCSD 675	(12)	Special Topics 1
SCSD 676	(9)	Special Topics 2
SCSD 677	(6)	Special Topics 3
SCSD 678	(3)	Special Topics 4

0-15 credits chosen from:

SCSD 673	(12)	M.Sc. Thesis 3
SCSD 674	(3)	M.Sc. Thesis 4

or courses in other departments, as arranged with the student's thesis supervisor.

11.5.7 Doctor of Philosophy (Ph.D.); Communication Sciences and Disorders

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (12 credits)

SCSD 652	(3)	Advanced Research Seminar 1
SCSD 653	(3)	Advanced Research Seminar 2
SCSD 685	(3)	Research Project 1
SCSD 686	(3)	Research Project 2
SCSD 701	(0)	Doctoral Comprehensive

Complementary Courses (6 credits)

Minimum of 6 credits of graduate-level statistics from courses such as:

EDPE 676	(3)	Intermediate Statistics
EDPE 682	(3)	Univariate/Multivariate Analysis
EDPE 684	(3)	Applied Multivariate Statistics
EPIB 621	(4)	Data Analysis in Health Sciences
EPIB 622	(3)	Scientific Communication
PSYC 650	(3)	Advanced Statistics 1
PSYC 651	(3)	Advanced Statistics 2

Any other course requirements specified for the student's individual program of study.

11.5.8 Doctor of Philosophy (Ph.D.); Communication Sciences and Disorders — Language Acquisition

Students must satisfy all program requirements for the Ph.D. in their home department. The Ph.D. thesis must be on a topic relating to language acquisition, approved by the LAP committee.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (14 credits)

EDSL 711	(2)	Language Acquisition Issues 3
LING 710	(2)	Language Acquisition Issues 2
PSYC 709	(2)	Language Acquisition Issues 1
SCSD 652	(3)	Advanced Research Seminar 1
SCSD 653	(3)	Advanced Research Seminar 2
SCSD 701	(0)	Doctoral Comprehensive

SCSD 712 (2) Language Acquisition Issues 4

Complementary Courses (9 credits)

3 credits of graduate-level statistics from courses such as:

EDPE 676	(3)	Intermediate Statistics
EDPE 682	(3)	Univariate/Multivariate Analysis
PSYC 650	(3)	Advanced Statistics 1
PSYC 651	(3)	Advanced Statistics 2

Students who have taken an equivalent course in statistics, or are currently taking an equivalent course as part of their Ph.D. program requirements, will be deemed to have satisfied this requirement for the Language Acquisition Option.

At least two courses, selected from the following list.

One of these two courses must be from outside Communication Sciences and Disorders.

EDSL 620	(3)	Critical Issues in Second Language Education
EDSL 623	(3)	Second Language Learning
EDSL 624	(3)	Educational Sociolinguistics
EDSL 627	(3)	Classroom-Centred Second Language Research
EDSL 629	(3)	Second Language Assessment
EDSL 632	(3)	Second Language Literacy Development
EDSL 664	(3)	Second Language Research Methods
LING 555	(3)	Language Acquisition 2
LING 590	(3)	Language Acquisition and Breakdown
LING 651	(3)	Topics in Acquisition of Phonology
LING 655	(3)	Theory of L2 Acquisition
PSYC 561	(3)	Methods: Developmental Psycholinguistics
PSYC 734	(3)	Developmental Psychology and Language
PSYC 736	(3)	Developmental Psychology and Language
SCSD 619	(3)	Phonological Development
SCSD 632	(3)	Phonological Disorders: Children
SCSD 633	(3)	Language Development
SCSD 637	(3)	Developmental Language Disorders 1
SCSD 643	(3)	Developmental Language Disorders 2

11.6 Epidemiology and Biostatistics**11.6.1 Location**

Department of Epidemiology, Biostatistics and Occupational Health
1020 Pine Avenue West
Montreal, QC H3A 1A2
Canada

Telephone: 514-398-6258

Email: graduate.eboh@mcgill.ca

Website: www.mcgill.ca/epi-biostat-occh

11.6.2 About Epidemiology and Biostatistics

The Department offers master's and doctoral programs in both Epidemiology and Biostatistics, as well as a Master's of Science in Public Health. The methods learned in these fields are used not only in the study of diseases, but also in health services research, program planning and evaluation, and policy development. Our faculty members are at the forefront of their research domains and include epidemiologists, biostatisticians, clinician scientists, medical informatics specialists, health economists, medical sociologists, and health geographers. Research in the Department spans all clinical specialties, pharmacoepidemiology, social epidemiology, infectious diseases, population and public health, environmental and occupational health, clinical and public health informatics, biostatistics, health care delivery and organization, and many cross-disciplinary activities. Faculty members may have funding available for students through their research grants. We provide rich research environments at five university-affiliated hospitals, public health agencies, and university research centres. Graduates pursue careers in academia, clinical settings, government agencies, and industry.

11.6.3 Epidemiology and Biostatistics Faculty

Chair

R. Fuhrer

Emeritus Professors

M.R. Becklake; M.B.B.Ch., M.D.(Witw.), F.R.C.P.

A. Lippman; B.A.(C'nell), Ph.D.(McG.)

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

I.B. Pless; B.A., M.D.(W. Ont.)

S.H. Shapiro; B.S.(Bucknell), M.S., Ph.D.(Stan.)

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

S. Wood-Dauphinee; B.Sc.(Phys.Ther.), Dip.Ed., M.Sc.(A.), Ph.D.(McG.)

Professors Post-Retirement

A. Lippman; B.A.(C'nell), Ph.D.(McG.)

I.B. Pless; B.A., M.D.(W. Ont.)

S.H. Shapiro; B.S.(Bucknell), M.S., Ph.D.(Stan.)

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

S. Wood-Dauphinee; B.Sc.(Phys.Ther.), Dip.Ed., M.Sc.(A.), Ph.D.(McG.)

Professors

M. Abrahamowicz; Ph.D.(Cracow) (*James McGill Professor*)

J.F. Boivin; M.D.(Laval), S.M., Sc.D.(Harv.)

J. Brophy; B.Eng.(McG.), M.Eng., M.D.(McM.), Ph.D.(McG.) (*joint appt. with Medicine*)

E.L.F. Franco; M.P.H., Dr.P.H.(Chapel Hill) (*joint appt. with Oncology*) (*James McGill Professor*)

R. Fuhrer; B.A.(CUNY (Brooklyn Coll.)), M.Sc., Ph.D.(Calif.-San Francisco)

T.W. Gyorkos; B.Sc.(McG.), M.Sc.(Bishop's), Ph.D.(McG.)

J.A. Hanley; B.Sc., M.Sc.(N.U.I.), Ph.D.(Wat.) (*on leave Jan. 2012 to June 2012 and Jan. 2013 to June 2013*)

J. Heymann; B.A.(Yale), M.P.H., M.D., Ph.D.(Harv.) (*joint appt. with Political Science*) (*Canada Research Chair*)

C. Infante-Rivard; M.D.(Montr.), M.P.H.(Calif.-LA), Ph.D.(McG.), F.R.C.P.(C) (*James McGill Professor*)

L. Joseph; M.Sc., Ph.D.(McG.)

M.S. Kramer; B.A.(Chic.), M.D.(Yale) (*joint appt. with Pediatrics*) (*James McGill Professor*) (*on leave Jan. 2012 to June 2013*)

J. McCusker; M.D.,C.M.(McG.), M.P.H., Ph.D.(Col.)

R. Menzies; M.D.,C.M., M.Sc.(McG.) (*joint appt. with Medicine*)

Professors

O.S. Miettinen; M.D.(Helsinki), M.P.H., M.S., Ph.D.(Minn.)
 G. Paradis; M.D.(Montr.), M.Sc.(McG.)
 R.W. Platt; M.Sc.(Manit.), Ph.D.(Wash.) (*joint appt. with Pediatrics*)
 S. Suissa; M.Sc.(McG.), Ph.D.(Flor.) (*joint appt. with Medicine*) (*James McGill Professor*)
 R. Tamblyn; M.Sc.(McM.), Ph.D.(McG.) (*joint appt. with Medicine*) (*James McGill Professor*)
 C. Wolfson; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Medicine*)

Associate Professors

O. Basso; Ph.D.(Milan) (*joint appt. with Obstetrics & Gynecology*)
 D. Buckeridge; M.D.(Qu.), M.Sc.(Tor.), Ph.D.(Stan.) (*Canada Research Chair*)
 A. Ciampi; M.Sc., Ph.D.(Qu.), Ph.D.(Rome)
 N. Dendukuri; M.Sc.(IIT), Ph.D.(McG.) (PT) (*joint appt. with Medicine*)
 C. Greenwood; B.Sc.(McG.), M.Sc.(Wat.), Ph.D.(Tor.) (*joint appt. with Oncology*)
 P. Héroux; B.Sc.(Laval), M.Sc., Ph.D.(I.N.R.S.)
 J. Kaufman; B.A.(Johns Hop.), Ph.D.(Mich.)
 A. Manges; B.A.(Col.), M.P.H., Ph.D.(Calif., Berk.)
 M. Pai; M.B.B.S.(Stanley Med. Coll.), M.D.(Christian Medical Coll.), Ph.D.(Calif., Berk.)
 J. Pickering; B.A.(Tor.), M.D., M.Sc.(McG.) (*joint appt. with Medicine*)
 A. Quesnel-Vallée; B.A., M.Sc.(Montr.), M.A., Ph.D.(Duke) (*joint appt. with Sociology*)
 M. Rossignol; B.Sc., M.D.(Sher.), M.Sc.(McG.)
 P. Tousignant; B.A., M.D.(Laval), M.Sc.(McG.), F.R.C.P.(C) (PT)

Assistant Professors

A. Adrien; M.D., M.Sc.(McG.)
 A. Benedetti; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Medicine*)
 J. Cox; B.Sc., B.A., M.D.(Dal.), M.Sc.(McG.), C.C.F.P., F.R.C.P.(C) (*joint appt. with Family Medicine*)
 S. Harper; B.A.(Westminster Coll.), M.S.P.H.(S. Carolina), Ph.D.(Mich.)
 A. Labbe; M.Sc.(Montr.), Ph.D.(Wat.) (*joint appt. with Psychiatry*)
 S. Martin; M.D.(Tor.), M.Sc.(McG.) (PT)
 E.E.M. Moodie; B.A.(Winn.), M.Phil.(Camb.), Ph.D.(Wash.)
 A. Nandi; B.S.(College of New Jersey), M.P.H.(Col.), Ph.D.(Johns Hop.) (*joint appt. with Institute for Health & Social Policy*)
 L. Patry; B.Sc., M.D.(Laval), F.R.C.P.(C) (PT)
 E. Strumpf; B.A.(Smith), Ph.D.(Harv.) (*joint appt. with Economics*)
 G. Tan; D.Phil.(Oxf.) (PT)

Associate Members

Biomedical Ethics Unit: N. King

Dentistry: P. Allison, J. Feine

Dietetics and Human Nutrition: K. Gray-Donald

Family Medicine: A. Andermann, J. Haggerty, T. Tannenbaum

Geography: N. Ross

Medicine: A. Barkun, M. Behr, S. Bernatsky, J. Bourbeau, P. Brassard, T. Brewer, A. Clarke, K. Dasgupta, M. Eisenberg, P. Ernst, M. Goldberg, C. Greenaway, S. Kahn, M. Klein, N. Mayo, N. Pant Pai, L. Pilote, E. Rahme, B. Richards, K. Schwartzman, M. Sewitch, I. Shrier, V. Tagalakis

Associate Members

Ob/Gyn: H. Abenhaim, R. Gagnon

Pathology: B. Case

Pediatrics: G. Dougherty, B. Foster, C. Quach-Thanh

Physical & Occupational Therapy: S. Ahmed

Psychiatry: E. Latimer, A. Malla, N. Schmitz, B. Thombs

Lecturers

J.P. Gauvin, W. Wood

Adjunct Professors

Asociación Civil Selva Amazónica Peru: M. Casapia

Caro Research: J. Caro

Direction régionale de la santé publique: R. Allard, M. Baillargeon, R. Lessard, S. Palmieri, S. Perron, E. Robinson

Harvard Univ.: J. Brownstein

Hôpital Sacré-Coeur: D. Gautrin

Independent: I. Arnold, M.A. Lavoie, J. Lemke, M. Schweigert, L. Scott

INSPQ: F. Richer, P. Robillard, S. Stock

Montreal Chest Hospital Centre: P. Rohan

Mount Sinai: M. Baltzan

Stabilis: P. Simon

Univ. de Montréal: F. Ducharme, R. Massé, J. Siemiatycki

Univ. of S. Australia: J. Lynch

11.6.4 Epidemiology

The Department offers master's and doctoral programs in both Epidemiology and Biostatistics, as well as a Master's of Science in Public Health. The methods learned in these fields are used not only in the study of diseases, but also in health services research, program planning and evaluation, and policy development. Our faculty members are at the forefront of their research domains and include epidemiologists, biostatisticians, clinician scientists, medical informatics specialists, health economists, medical sociologists, and health geographers. Research in the Department spans all clinical specialties, pharmacoepidemiology, social epidemiology, infectious diseases, population and public health, environmental and occupational health, clinical and public health informatics, biostatistics, health care delivery and organization, and many cross-disciplinary activities. Faculty members may have funding available for students through their research grants. We provide rich research environments at five university-affiliated hospitals, public health agencies, and university research centres. Graduates pursue careers in academia, clinical settings, government agencies, and industry.

section 11.6.4.2: Master of Science (M.Sc.); Epidemiology (Thesis) (48 credits)

Applicants to the M.Sc. program should hold a bachelor's degree in the natural and quantitative sciences (e.g., microbiology, computer science, statistics, economics, geography) or social sciences (e.g., sociology, psychology, anthropology), or hold a degree in one of the health professional sciences (e.g., medicine, nursing, social work, nutrition). Applicants must have an interest in health research, along with strong conceptual, analytic, and quantitative skills (differential and integral calculus) at the undergraduate level.

The program leading to a master's degree is designed to provide training in both theory and practice in the selected discipline. Courses require intellectual and academic rigour, and the program provides students with an opportunity to synthesize the training in the form of a thesis. Students will study the foundations and principles of epidemiology and applied biostatistics, in order to design, conduct, and analyze clinical, population-based, environmental, pharmaco-epidemiological, policy, and methodological health-related research. Graduates of the program often go on to do doctoral work or become research associates in public, private, and academic settings. McGill graduates are known for methodological and quantitative rigour, and quantitative analytic independence. While their core training is in methods, rather than specific substantive areas, students learn about substantive areas in the context of their research and through elective courses.

section 11.6.4.3: Master of Science (M.Sc.); Public Health (Non-Thesis) (60 credits)

The mission of the M.Sc.P.H. is to train outstanding public health professionals and future leaders by offering a rigorous academic program in methods, research, and practice. This program may be of interest for students from the natural and quantitative sciences (e.g., microbiology, computer science, statistics, economics, geography), social sciences (e.g., sociology, psychology, anthropology), or the health professions (e.g., medicine, nursing, social

section 11.6.4.3: Master of Science (M.Sc.); Public Health (Non-Thesis) (60 credits)

work, nutrition). Students will study the foundations and principles of epidemiology and biostatistics, as applied to public health research and practice, in order to design, conduct, and analyze clinical, population-based, environmental, policy, and methodological public health-related research. Graduates of the program will serve as public health practitioners, research professionals, and educators, and will possess the competencies and professionalism to carry out broad public health functions in local, provincial, national, and international settings. In exceptional circumstances, the admissions committee may take professional experience into account for mid-career or returning/re-entry applicants. The Master's of Public Health program will include a three-month practicum after the first year, which will provide the student with the opportunity to use knowledge and skills acquired in the academic program in a public health practice or research setting.

section 11.6.4.4: Master of Science (M.Sc.); Public Health (Non-Thesis) — Environment (60 credits)

A number of departments and faculties throughout McGill University have joined with the McGill School of Environment (MSE) to provide an Environment Option as part of a variety of existing graduate degrees. The option provides students with an appreciation of the role of science in informed decision-making in the environment sector, and the influence that political, socio-economic, and ethical judgments have. The option also provides a forum whereby graduate students bring their disciplinary perspectives together and enrich each other's learning through structured courses, formal seminars, and informal discussions and networking. Students who have been admitted through their home department or faculty may apply for admission to the option. Option requirements are consistent across academic units. The option is coordinated by the MSE, in partnership with participating academic units.

section 11.6.4.5: Doctor of Philosophy (Ph.D.); Epidemiology

This program may be of interest to students from the natural and quantitative sciences (e.g., microbiology, computer science, statistics, economics, geography), social sciences (e.g., sociology, psychology, anthropology), or the health professions (e.g., medicine, nursing, social work, nutrition). Applicants must have an interest in health research, along with strong conceptual, analytic, and quantitative skills (differential and integral calculus) at the undergraduate level.

The Ph.D. program prepares students with the advanced epidemiological research skills needed to undertake original contributions to new knowledge related to the determinants of health and disease, prevention, prognosis, treatment, and outcomes. The program is generally completed in four to five years. Graduates will be prepared to engage in scientific collaboration, and communicate results to other scientists and diverse audiences. They will go on to careers in public health, health planning, and quality monitoring in local, regional, federal, and international health authorities, statistical and technology assessment agencies, the pharmaceutical industry, and in clinical and academic research organizations. McGill graduates are known for their methodological and quantitative rigour and quantitative analytic independence. While their core training is in methods, rather than specific substantive areas, students learn about substantive areas in the context of their research and through elective courses.

section 11.6.4.6: Graduate Diploma in Epidemiology (30 credits)

Applications to the Diploma program will not be accepted for the 2012–2013 academic year.

11.6.4.1 Epidemiology Admission Requirements and Application Procedures**11.6.4.1.1 Admission Requirements**

Revision, October 2012. Start of revision.

Graduate Diploma

(Applications to the Diploma program will not be accepted for the 2012–2013 academic year.)

Master's

Applicants to the M.Sc. programs must hold a bachelor's degree in a related area, possess a reasonable level of mathematical competency, and have a good knowledge of differential and integral calculus at the level of a CEGEP or first-year undergraduate course.

Ph.D.

Applicants to the Ph.D. program who hold a master's in epidemiology are eligible for admission to the core year. Applicants with other graduate-level degrees or exceptional students without a master's degree are also eligible and will be considered for admission to a preparatory year.

Complete details on the Epidemiology programs are available on our Departmental website at: www.mcgill.ca/epi-biostat-occh/grad/epidemiology/requirements.

Language Requirement

Minimum TOEFL scores required, when applicable, of 100 on the Internet-based test. Minimum score for IELTS: 6.5.

11.6.4.1.1 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

Completed applications, with all supporting documents, must reach the Department by the Dates for Guaranteed Consideration.

Please download required documents from our website: www.mcgill.ca/epi-biostat-occh, then select the Graduate Studies tab to link to the appropriate degree program.

11.6.4.1.12 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: Dec. 15	Fall: Dec. 15	Fall: Apr. 30
Winter: N/A	Winter: N/A	Winter: Sept. 15
Summer: N/A	Summer: N/A	Summer: Feb. 28

Revision, October 2012. End of revision.

11.6.4.2 Master of Science (M.Sc.); Epidemiology (Thesis) (48 credits)

Students will study the foundations and principles of epidemiology and applied biostatistics, in order to design, conduct, and analyze clinical, population-based, environmental, policy, and methodological health-related research. Graduates will be prepared to engage in scientific collaboration, and communicate results to other scientists and diverse audiences.

Thesis Course (24 credits)

EPIB 690 (24) M.Sc. Thesis

Required Courses (22 credits)

Students exempted from any of the courses listed below must replace them with additional complementary course credits.

EPIB 601	(4)	Fundamentals of Epidemiology
EPIB 602	(3)	Foundations of Population Health
EPIB 603	(4)	Intermediate Epidemiology
EPIB 605	(1)	Critical Appraisal in Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 613	(1)	Introduction to Statistical Software
EPIB 614	(1)	Basics of Measurement in Epidemiology
EPIB 621	(4)	Data Analysis in Health Sciences

Complementary Course (2 credits)

2 credits of coursework, at the 500 level or higher, chosen in consultation with the student's academic adviser or supervisor.

11.6.4.3 Master of Science (M.Sc.); Public Health (Non-Thesis) (60 credits)

Students will study the foundations and principles of epidemiology and biostatistics as applied to public health research and practice, in order to design, conduct, and analyze clinical, population-based, environmental, policy, and methodological public health-related research. The program will include a three-month practicum after the first year.

Research Project (14 credits)

EPIB 630 (14) Public Health Project

Required Courses (25 credits)

Students exempted from any of the courses listed below must replace them with additional complementary course credits.

EPIB 601	(4)	Fundamentals of Epidemiology
EPIB 602	(3)	Foundations of Population Health
EPIB 603	(4)	Intermediate Epidemiology
EPIB 605	(1)	Critical Appraisal in Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 612	(3)	Principles of Public Health Practice

EPIB 613	(1)	Introduction to Statistical Software
EPIB 614	(1)	Basics of Measurement in Epidemiology
EPIB 621	(4)	Data Analysis in Health Sciences

Complementary Courses (21 credits)

13 credits of coursework at the 500 level or higher, with a minimum of 2 credits chosen from each of the following fields:

Environmental health sciences;

Health services research policy and management;

Population and public health interventions (social and behavioural science);

Epidemiology in practice or field epidemiology.

8 credits of coursework, at the 500 level or higher.

Courses must be approved by the program's academic adviser.

11.6.4.4 Master of Science (M.Sc.); Public Health (Non-Thesis) — Environment (60 credits)

Students will study the foundations and principles of epidemiology and biostatistics as applied to public health research and practice, in order to design, conduct, and analyze clinical, population-based, environmental, policy, and methodological public health-related research.

The program will include a three-month practicum after the first year.

Research Project (14 credits)

EPIB 630	(14)	Public Health Project
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Required Courses (31 credits)

Students exempted from any of the courses listed below must replace them with additional complementary course credits.

ENVR 610	(3)	Foundations of Environmental Policy
ENVR 650	(1)	Environmental Seminar 1
ENVR 651	(1)	Environmental Seminar 2
ENVR 652	(1)	Environmental Seminar 3
EPIB 601	(4)	Fundamentals of Epidemiology
EPIB 602	(3)	Foundations of Population Health
EPIB 603	(4)	Intermediate Epidemiology
EPIB 605	(1)	Critical Appraisal in Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 612	(3)	Principles of Public Health Practice
EPIB 613	(1)	Introduction to Statistical Software
EPIB 614	(1)	Basics of Measurement in Epidemiology
EPIB 621	(4)	Data Analysis in Health Sciences

Complementary Courses (15 credits)

10 credits of coursework at the 500 level or higher, with a minimum of 2 credits chosen from each of the following fields:

Health services research policy and management;

Population and public health interventions (social and behavioural science);

Epidemiology in practice or field epidemiology.

Courses must be approved by the program's academic adviser.

3 credits chosen from:

ENVR 519	(3)	Global Environmental Politics
ENVR 544	(3)	Environmental Measurement and Modelling
ENVR 620	(3)	Environment and Health of Species
ENVR 622	(3)	Sustainable Landscapes
ENVR 630	(3)	Civilization and Environment
ENVR 680	(3)	Topics in Environment 4

or other courses at the 500 level or higher recommended by the advisory committee and approved by the Environmental Option Committee.

AND

2 credits of coursework, at the 500 level or higher, chosen in consultation with the student's academic adviser or supervisor.

11.6.4.5 Doctor of Philosophy (Ph.D.); Epidemiology

Preparatory Year

Students who are admitted to the Ph.D. degree program without the equivalent of an M.Sc. in epidemiology at McGill will, in their first year, be required to take, as a minimum, the following courses: EPIB 601, EPIB 602, EPIB 603, EPIB 605, EPIB 607, EPIB 613, EPIB 614, EPIB 621 (equivalent to required coursework of the master's program).

This year is called the Preparatory Year. Students then continue, in their second year, into the Core Year.

Core Year

Students who are admitted to the Ph.D. degree program with the equivalent of the M.Sc. in epidemiology at McGill will, in their first year, be required to take, as a minimum, 15 credits of required Ph.D. courses. This year is called the Core Year.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (12 credits)

EPIB 608	(3)	Advanced Epidemiology
EPIB 609	(3)	Seminar on Advanced Methods in Epidemiology
EPIB 610	(3)	Advanced Methods: Causal Inference
EPIB 623	(3)	Research Design in Health Sciences
EPIB 701	(0)	Ph.D. Comprehensive Examination
EPIB 702	(0)	Ph.D. Proposal

Complementary Courses (34 credits)

12-34 credits

0-22 credits* from the following:

EPIB 601	(4)	Fundamentals of Epidemiology
EPIB 602	(3)	Foundations of Population Health
EPIB 603	(4)	Intermediate Epidemiology
EPIB 605	(1)	Critical Appraisal in Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 613	(1)	Introduction to Statistical Software
EPIB 614	(1)	Basics of Measurement in Epidemiology
EPIB 621	(4)	Data Analysis in Health Sciences

* Note: If a student has not already successfully completed them or their equivalent.

12 credits of coursework, at the 500 level or higher, of which a minimum of 3 credits in ethics (medical/public health/research), 3 credits in biostatistics, 3 credits in substantive topic, and 3 credits in epidemiology. Courses must be chosen and approved in consultation with the program's academic adviser.

11.6.4.6 Graduate Diploma in Epidemiology (30 credits)

(Applications to the Diploma program will not be accepted for the 2012-2013 academic year.)

Required Courses (17 credits)

EPIB 601	(4)	Fundamentals of Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 650	(9)	Diploma Dissertation

Note: Students exempted from either EPIB 601 and/or EPIB 607 must replace them with additional complementary course credits.

Complementary Courses

13 credits of coursework, at the 500, 600, or 700 level, chosen in consultation with the student's academic adviser.

11.6.5 Biostatistics

Biostatistics involves the development and application of statistical methods to scientific research in areas such as medicine, epidemiology, environmental health, genetics, and ecology. Biostatisticians play key roles in designing studies—from helping to formulate the questions that can be answered by data collection to the decisions on how best to collect the data—and in analyzing the resulting data. They also develop new statistical methods for such data. Students will take courses, and may do research, on topics such as mathematical statistics, statistical methods for epidemiology, generalized linear models, survival analysis, longitudinal data, and clinical trials. The Department of Epidemiology, Biostatistics, and Occupational Health has one of the largest concentrations of Ph.D.-level statisticians in any Canadian Faculty of Medicine.

section 11.6.5.2: Master of Science (M.Sc.); Biostatistics (Thesis) (48 credits)

M.Sc. thesis students study a foundational set of courses, and write a thesis on a topic of their choice. Thesis students should have a strong interest in research. These students are well-placed to either continue in a Ph.D. program or to work in academic research in statistics or medicine; they will also have relevant qualifications for the pharmaceutical industry and government.

section 11.6.5.3: Master of Science (M.Sc.); Biostatistics (Non-Thesis) (48 credits)

The M.Sc. non-thesis program is designed to expose students to a wide range of topics including statistical methods for epidemiology, generalized linear models, survival analysis, longitudinal data, and clinical trials. Skills in data analysis, statistical consulting, communication, and report writing are emphasized, and students graduate ready to work in the pharmaceutical and biotechnology industries, in government, or in academic medical research.

section 11.6.5.4: Doctor of Philosophy (Ph.D.); Biostatistics

Applicants should hold a master's degree in mathematics or statistics or its equivalent. Mastery of calculus, linear algebra, real analysis, and mathematical statistics is essential. Exposure to data analysis is an asset. Exceptional students without a master's degree will be considered for admission, starting with a Qualifying year. Ph.D. students typically work on development of statistical methods, and can specialize in statistical methods for epidemiology, generalized linear models, Bayesian methods, survival analysis, longitudinal data, causal inference, and clinical trials. Skills in data analysis, statistical consulting, and report writing are emphasized. Ph.D. graduates typically work as faculty in universities, in research institutes, in government, or in the pharmaceutical industry.

11.6.5.1 Biostatistics Admission Requirements and Application Procedures

11.6.5.1.1 Biostatistics

Revision, October 2012. Start of revision.

11.6.5.1.1.1 Admission Requirements

An undergraduate degree in mathematics or statistics or its equivalent (an honours degree is preferred, but not required). At least three semesters of calculus, two semesters of linear algebra, at least one, but preferably two semesters of real analysis, and a full year course/sequence in mathematical statistics preferably at an honours level, e.g., MATH 356/357. Exposure to data analysis is an asset.

M.Sc.: Students admitted into the M.Sc. program will, in general, meet the requirements above.

Ph.D.: Exceptional students without a master's degree but with the above qualifications will be considered for Ph.D. admission starting with a Qualifying year.

Complete details on the Biostatistics programs are available on our Departmental website at: www.mcgill.ca/epi-biostat-occh/grad/biostatistics/requirements.

Language Requirement

Minimum TOEFL scores required, when applicable, of 100 on the Internet-based test. Minimum score for IELTS: 6.5.

11.6.5.1.12 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

Completed applications, with all supporting documents, must reach the Department by the Dates for Guaranteed Consideration. Please see our website at www.mcgill.ca/epi-biostat-occh/grad/biostatistics/applying for information on required documents as well as the application deadline.

11.6.5.1.13 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: Dec. 15	Fall: Dec. 15	Fall: April 30
Winter: N/A	Winter: N/A	Winter: Sept. 15
Summer: N/A	Summer: N/A	Summer: Feb. 15

Revision, October 2012. End of revision.

11.6.5.2 Master of Science (M.Sc.); Biostatistics (Thesis) (48 credits)

Training in statistical theory and methods, applied data analysis, scientific collaboration, communication, and report writing by coursework and thesis.

Thesis Courses (24 credits)

BIOS 690 (24) M.Sc. Thesis

Required Courses (24 credits)

Students exempted from any of the courses listed below must replace them with complementary course credits, at the 500 level or higher, chosen in consultation with the student's academic adviser or supervisor.

BIOS 601	(4)	Epidemiology: Introduction and statistical models
BIOS 602	(4)	Epidemiology: Regression Models
MATH 523	(4)	Generalized Linear Models
MATH 533	(4)	Honours Regression and Analysis of Variance
MATH 556	(4)	Mathematical Statistics 1
MATH 557	(4)	Mathematical Statistics 2

11.6.5.3 Master of Science (M.Sc.); Biostatistics (Non-Thesis) (48 credits)

Training in statistical theory and methods, applied data analysis, scientific collaboration, communication, and report writing by coursework and project.

Research Project (6 credits)

BIOS 630 (6) Research Project/Practicum in Biostatistics

Required Courses (24 credits)

Students exempted from any of the courses listed below must replace them with additional complementary course credits.

BIOS 601	(4)	Epidemiology: Introduction and statistical models
BIOS 602	(4)	Epidemiology: Regression Models
MATH 523	(4)	Generalized Linear Models
MATH 533	(4)	Honours Regression and Analysis of Variance
MATH 556	(4)	Mathematical Statistics 1

MATH 557 (4) Mathematical Statistics 2

Complementary Courses (18 credits)

18 credits of coursework, at the 500 level or higher, chosen in consultation with the student's academic adviser or supervisor.

11.6.5.4 Doctor of Philosophy (Ph.D.); Biostatistics

Students will study theoretical and applied statistics and related fields; the program will train them to become independent scientists able to develop and apply statistical methods in medicine and biology and make original contributions to the theoretical and scientific foundations of statistics in these disciplines. Graduates will be prepared to develop new statistical methods as needed and apply new and existing methods in a range of collaborative projects. Graduates will be able to communicate methods and results to collaborators and other audiences, and teach biostatistics to biostatistics students, students in related fields, and professionals in academic and other settings.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses

BIOS 700	(0)	Ph.D. Comprehensive Examination Part A
BIOS 701	(0)	Ph.D. Comprehensive Examination Part B
BIOS 702	(0)	Ph.D. Proposal

Complementary Courses (28 credits)

0-28 credits from the following list: (if a student has not already successfully completed them or their equivalent)

BIOS 601	(4)	Epidemiology: Introduction and statistical models
BIOS 602	(4)	Epidemiology: Regression Models
BIOS 624	(4)	Data Analysis & Report Writing
MATH 523	(4)	Generalized Linear Models
MATH 533	(4)	Honours Regression and Analysis of Variance
MATH 556	(4)	Mathematical Statistics 1
MATH 557	(4)	Mathematical Statistics 2

12 credits (chosen and approved in consultation with the student's academic adviser), at the 500 level or higher, in statistics/biostatistics.

6 credits (chosen and approved in consultation with the student's academic adviser), at the 500 level or higher, in related fields (e.g., epidemiology, social sciences, biomedical sciences).

11.7 Experimental Medicine

Please see [section 11.11: Medicine, Experimental](#) for more information.

11.8 Family Medicine Option

Please see [section 11.12: Medicine, Family \(Option\)](#) for more information.

11.9 Human Genetics

11.9.1 Location

Department of Human Genetics
Stewart Biological Sciences Building
1205 Dr. Penfield Avenue, N5/13
Montreal, QC H3A 1B1
Canada

Telephone: 514-398-4198

Fax: 514-398-2430

Email: grad.hg@mcgill.ca

Website: www.mcgill.ca/humangenetics

11.9.2 About Human Genetics

M.Sc. and Ph.D. Degrees in Human Genetics

The Department of Human Genetics offers a clinical master's program in Genetic Counselling, as well as research training at both the M.Sc. and Ph.D. levels. Both the M.Sc. and Ph.D. research programs require the completion of a thesis, which is the major focus of the student's effort. A minimal amount of coursework is required, but specific course choices are flexible and vary according to the student's previous training and current research interest. The Department also offers a Bioinformatics option. Information on the Bioinformatics option can be found at: www.mcgill.ca/mcb/academic/graduate.

Most of the faculty of the Human Genetics Department are located in McGill teaching hospitals, reflecting the medically learned knowledge at the core of human genetic studies.

Faculty have a wide variety of research interests, which embrace: cancer genetics, cytogenetics, reproductive biology, neurogenetics, and genomic and genetic basis of human diseases. Detailed information regarding faculty research interest can be found on the Department web page at www.mcgill.ca/humangenetics/prospective-students/supervision.

Students accepted into the Human Genetics research graduate program will receive a minimum stipend of \$15,000, plus tuition and fees.

Tuition Differential Fee Waivers

A certain number of tuition differential fee waivers will be offered to incoming out-of-province/international students who have demonstrated outstanding academic achievement. Students who have a **CGPA of 3.5/4.0 or above** (as converted by McGill GPS guidelines) and who submit online application and documents by **Jan. 31 (Summer), March 31 (Fall), Sept. 30 (Winter)** will automatically be considered for a tuition waiver.

section 11.9.5: Master of Science (M.Sc.); Human Genetics (Thesis) (45 credits)

The Department of Human Genetics provides a unified curriculum of study in genetics. Areas of specialization include: biochemical genetics, genetics of development, animal models of human diseases, cancer genetics, molecular pathology, gene therapy, genetic dissection of complex traits, genetics of infectious and inflammatory diseases, non-mendelian genetics, bioinformatics, behavioural genetics, neurogenetics, bioethics, and genomics. Many of our faculty hold cross-appointments in various departments (including: biochemistry, biology, cardiology, medicine, microbiology, immunology, neurology, pathology, paediatrics, pharmacology, psychiatry) within the Faculties of Science and Medicine. This enables numerous opportunities for interdisciplinary research and collaboration. The Department conducts research on all sites of the McGill University Health Centre (MUHC), the Montreal Neurological Institute and Hospital, the McGill Life Sciences Complex, the McGill University-Genome Quebec Innovation Centre, the Biomedical Ethics Unit, and the Centre for Genomics and Policy.

section 11.9.6: Master of Science (M.Sc.); Human Genetics (Thesis) — Bioinformatics (45 credits)

Students successfully completing the Bioinformatics option at the M.Sc. level will be fluent in the concepts, language, approaches, and limitations of the field. Bioinformatics research lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. The intention of the Bioinformatics Option is to train students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyze datasets, the application of modelling techniques, the creation of tools for manipulating bioinformatics data, the integration of biological databases and the use of algorithms and statistics.

Enrolment in the Bioinformatics option can only be approved after a student has been admitted into the Department. There is an agreement for the option that must be signed by the student, supervisor, and Department, and enrolment in the option is subject to space availability and other constraints that the Department cannot assess at the time of admission. For more information, please contact the Graduate Program Coordinator.

section 11.9.7: Master of Science (M.Sc.); Human Genetics (Thesis) — Bioethics (45 credits)

McGill University offers specialized education in bioethics to graduate students in the Faculties of Medicine, Religious Studies, and Law, and the Department of Philosophy. The Master's degree Specialization in Bioethics is an interdisciplinary academic program that emphasizes both the conceptual and the practical aspects of bioethics.

section 11.9.8: Master of Science (M.Sc.); Genetic Counselling (Non-Thesis) (48 credits)

The M.Sc. in Genetic Counselling program provides the academic foundation and clinical training required for the contemporary practice of genetic counselling. Genetic counsellors are health professionals who provide information and support to families who have members with birth defects or genetic disorders and to families who may be at risk for a variety of inherited conditions. Genetic counsellors investigate the problem present in the family, analyze inheritance patterns and risks of recurrence, and review available options with the family. Some counsellors also work in administrative and academic capacities, and many engage in research activities. The curriculum includes a variety of required courses in human genetics and other departments, and 40 weeks of supervised clinical training spread over four semesters. Graduates will be eligible to sit for both the Canadian Association of Genetic Counsellors and the American Board of Genetic Counselling certification examinations. Upon completion of the M.Sc. in Genetic Counselling program, students will demonstrate competence in, or satisfactory knowledge of: principles of human genetics, including cytogenetics, biochemical, molecular, and population genetics; methods of interviewing and counselling, and the dynamics of human behaviour in relation to genetic disease; and social, legal, and ethical issues in genetics. Enrolment will be limited to four students.

section 11.9.9: Doctor of Philosophy (Ph.D.); Human Genetics

The Department of Human Genetics provides a unified curriculum of study in genetics. Areas of specialization include: biochemical genetics, genetics of development, animal models of human diseases, cancer genetics, molecular pathology, gene therapy, genetic dissection of complex traits, genetics of infectious and inflammatory diseases, non-mendelian genetics, bioinformatics, behavioural genetics, neurogenetics, bioethics, and genomics. Many of our faculty hold cross-appointments in various departments (including: biochemistry, biology, cardiology, medicine, microbiology, immunology, neurology, pathology, paediatrics, pharmacology, psychiatry) within the Faculties of Science and Medicine. This enables numerous opportunities for interdisciplinary research and collaboration. The Department conducts research on all sites of the McGill University Health Centre (MUHC), the Montreal Neurological Institute and Hospital, the McGill Life Sciences Complex, the McGill University-Genome Quebec Innovation Centre, the Biomedical Ethics Unit, and the Centre for Genomics and Policy.

section 11.9.10: Doctor of Philosophy (Ph.D.); Human Genetics — Bioinformatics

Students successfully completing the Bioinformatics option at the Ph.D. level will be fluent in the concepts, language, approaches, and limitations of the field and have the capability of developing an independent Bioinformatics research program. Bioinformatics research lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. The intention of the Bioinformatics option is to train students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyze datasets, the application of modelling techniques, the creation of tools for manipulating bioinformatics data, the integration of biological databases, and the use of algorithms and statistics.

Enrolment in the Bioinformatics option can only be approved after a student has been admitted into the Department. There is an agreement for the option that must be signed by the student, supervisor, and Department, and enrolment in the option is subject to space availability and other constraints that the Department cannot assess at the time of admission. For more information, please contact the Graduate Program Coordinator.

11.9.3 Human Genetics Admission Requirements and Application Procedures**11.9.3.1 Admission Requirements**

Revision, October 2012. Start of revision.

M.Sc. in Genetic Counselling

Prerequisites: Bachelor's degree – 3.0/4.0 or 3.2/4.0 for the last two full-time academic years. Recent (five years or less) university-level courses in the Basic Sciences (basic biology, cell and molecular, biochemistry, principles of human genetics, or basic genetics with a significant “human” component) and a *minimum* of two Social Sciences (social psychology, abnormal psychology).

Prerequisites or corequisites: Recent (five years or less) university-level course in statistics.

Applicants must have obtained some experience (either paid or volunteer) working in a counselling or advisory capacity, ideally in a health care setting.

Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit a TOEFL score of 600 on the TOEFL paper-based test (or 100 on the Internet-based test), with each component score no less than 20, as the **minimum** standard for admission.

M.Sc. and Ph.D. in Human Genetics

Prerequisites: B.Sc. – minimum CGPA 3.0/4.0 or 3.2/4.0 for the last two full-time academic years. Applicants must have a minimum of 6 credits in cellular and molecular biology or biochemistry, 3 credits in mathematics or statistics, and 3 credits in genetics. Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit a TOEFL score of 600 on the TOEFL paper-based test (or 100 on the Internet-based test), with each component score no less than 20, or 7 on the IELTS, as the minimum standard for admission.

Admission is based on an evaluation by the Graduate Training Committee and on acceptance by a research director who has agreed to provide adequate funding for the duration of the academic program. Prospective graduate students should complete the online application form and indicate at least three faculty members they are interested in working with.

11.9.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

11.9.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

M.Sc. in Genetic Counselling

- Three reference letters
- Personal Statement
- Interview

Documentation and online application must be received by January 15th. Interviews will be arranged during the weeks of March 1–April 15 for the top 18 candidates. Admission to the program will be based on academic record, reference letters, personal statement, and interview.

M.Sc. and Ph.D. in Human Genetics

- Admission is based on acceptance by a research director who has agreed to provide adequate funding for the duration of the academic program.

11.9.3.3 Dates for Guaranteed Consideration

Canadian			International			Special/ Exchange/ Visiting
M.Sc. Genetic Counselling program* (Non-Thesis)	M.Sc. (Thesis) programs	Ph.D. programs	M.Sc. Genetic Counselling program* (Non-Thesis)	M.Sc. (Thesis) programs	Ph.D. programs	
Fall: Jan. 15	Fall: March 31	Fall: March 31	Fall: Jan. 15	Fall: March 31	Fall: March 31	Fall: N/A
Winter: N/A	Winter: Sept. 30	Winter: Sept. 30	Winter: N/A	Winter: Sept. 30	Winter: Sept. 30	Winter: N/A
Summer: N/A	Summer: N/A**	Summer: Jan. 31	Summer: N/A	Summer: N/A**	Summer: Jan. 31	Summer: N/A

Applications for thesis programs submitted after these deadlines may be considered, if a suitable supervisor can be secured. However, these applications will not be considered for departmental funding or entrance awards.

* **M.Sc. Genetic Counselling program** accepts applications for the Fall term only. **No late applications or applications for Summer or Winter terms for the Genetic Counselling program will be considered under any circumstances.**

** The Department of Human Genetics is not willing to consider any applications to the M.Sc. (Thesis) for the Summer term.

Revision, October 2012. End of revision.

11.9.4 Human Genetics Faculty

Chair

D.S. Rosenblatt

Program Directors

J. Fitzpatrick – *M.Sc. in Genetic Counselling*

E. Shoubridge – *M.Sc. and Ph.D. in Human Genetics*

Administrative Assistant

K. Springer

Graduate Program Coordinator

T. Leslie

Assistant Graduate Program Coordinator

C. Tao

Emeritus Professors

V. Der Kaloustian; B.A.(Acad.), M.Sc., Ph.D., M.D.,C.M.(McG.), D.Sc.(Acad.), F.R.S.C., F.R.C.P.S.(C)

F.C. Fraser; B.Sc.(Acad.) M.Sc., Ph.D., M.D.,C.M., D.Sc.(McG), O.C., F.R.S.C.

K. Glass; M.A.(Barat), B.C.L., D.C.L.(McG.)

B. Mukherjee; B.Sc.(Calc.), M.S.(Brig. Young), Ph.D.(Utah)

L. Pinsky; M.D.(McG.)

C. Scriver; B.A., M.D.,C.M.(McG.)

H. Tenenhouse; M.Sc., Ph.D.(McG.)

ProfessorsE. Andermann; M.Sc., Ph.D., M.D.,C.M.(McG.) (*Neurology and Neurosurgery*)A. Duncan; B.Sc.(Qu.), Ph.D.(Edin.) (*Pathology and Pediatrics*)W. Foulkes; B.Sc., MB.BS., Ph.D.(Lond.) (*Medicine*)F. Glorieux; M.D.(Louvain), Ph.D.(McG.) (*Surgery*)F. Kaplan; B.A.(Col.), Ph.D.(McG.) (*Pediatrics*)B. Knoppers; Ph.D.(Sorbonne, France), Ad.E., O.C. (*Director, Centre of Genomics and Policy*)M. Lathrop; B.Sc., M.Sc.(Alta.), Ph.D.(Wash.) (*Director, McGill University-Genome Quebec Innovation Centre*)D. Malo; D.U.M., M.Sc.(Montr.), Ph.D.(McG.) (*William Dawson Scholar (Medicine)*)R. McInnes; C.M.,M.D., Ph.D., F.R.S.C.(McG.) (*Alva Chair in Human Genetics (Director, Lady Davis Research Institute)*)K. Morgan; B.S., M.S., Ph.D.(Mich.) (*Medicine*)R. Palmour; B.A.(Texas W.), Ph.D.(Texas) (*Psychiatry and Biology*)D. Radzioch; M.Sc., Ph.D.(Jagiellonian, Krakow) (*Medicine*)D.S. Rosenblatt; M.D.,C.M.(McG.) (*Medicine, Pediatrics and Biology*)R. Rozen; B.Sc., Ph.D.(McG.) (*Pediatrics and Biology*)E. Schurr; M.Sc., Ph.D.(Albert-Ludwigs, Freiburg) (*Medicine*)E. Shoubridge; B.Sc., M.Sc.(McG.), Ph.D.(Br. Col.) (*Neurogenetics*)R. St-Arnaud; B.Sc.(Montr.), Ph.D.(Laval) (*Surgery*)J. Trasler; M.D.,C.M., Ph.D.(McG.) (*William Dawson Scholar (Pathology and Pediatrics)*)S. Vidal; Ph.D.(Genève) (*Medicine*)**Associate Professors**A. Ao; Ph.D.(Lond.) (*OBS/GYN*)D. Avard; Ph.D.(Camb.) (*Centre of Genomics and Policy*)G. Bourque; B.Sc.(Montr.), M.A., Ph.D.(USC) (*Genome Quebec*)B. Brais; M.D.,C.M., Ph.D.(McG.) (*Neurology and Neurosurgery*)N. Braverman; B.Sc.(C' nell), M.Sc.(Sarah Lawrence), M.D.(Tulane) (*Pediatrics*)K. Dewar; Ph.D.(Laval) (*Genome Quebec*)

J. Majewski; B.Sc., M.Sc.(Stan.), Ph.D.(Wesl.)

Associate Professors

S. Melançon; M.D.(Montr.)
 R. Nadon; B.A., M.A., Ph.D.(C'dia)
 V. Ozdemir; M.D.(Hacettepe), M.Sc., Ph.D.(Tor.) (*Centre of Genomics and Policy*)
 L. Russell; B.A., M.D.(Ind.) (*Pediatrics*)
 M. Tischkowitz; M.D., Ph.D.(Lond.) (*Cancer Genetics*) (*on leave*)
 P. Tonin; B.Sc., M.Sc., Ph.D.(Tor.) (*Medicine*)

Assistant Professors

L. Beitel; Ph.D.(McG.) (*Biochemistry*)
 L. Cartier; B.Sc., M.Sc.(McG.)
 G. Chong; Ph.D.(Kansas)
 C. Crist; B.Sc.(Br. Col.), M.Sc., Ph.D.(Tokyo)
 M. Fujiwara; M.Sc.(Alta.) (*Quantitative Genetics*)
 Y. Joly; Ph.D.(McG.) (*Centre of Genomics and Policy*)
 P. Moffatt; Ph.D.(Montr.) (*Pharmacology*)
 T. Pastinen; M.D., Ph.D.(Helsinki)
 Y. Riaz Alhosseini; Ph.D.(Heidel.) (*Genome Quebec*)
 R. Sladek; B.A.Sc., M.D.(Tor.)
 R. Slim; M.Sc.(Lebanon), M.Sc., Ph.D.(Paris VII)
 Y. Yamanaka; Ph.D.(Osaka) (*Goodman Cancer Research Centre*)

Lecturers

N. Bolduc (*Pediatrics*), S. Drury (*Pediatrics*), J. Fitzpatrick (*Pediatrics, Medicine*), S. Fox (*Medicine*), L. Kasprzak (*Medicine*), M. Lalous (*Medicine*), Lynn Macrae (*Medicine*), L. Palma (*Medicine*), C. Pouchet (*JGH*), A. Secord (*Pediatrics*), G. Sillon (*Medicine*), R. Vanneste (*Pediatrics*), Laura Whelton (*Medicine*), N. Wong (*Medicine*), S. Zaor (*Medicine*)

Associate Members

Biochemistry: P. Gros; D. Thomas
Bioethics: J. Kimmelman
Cardiology: J. Genest
Endocrinology: C. Polychonakos, B. Richards
Epidemiology: A. Lippman
Law: R. Gold
Medical Genetics (MUHC): R. Agatep, I. DeBie
Medicine: D. Cournoyer, J. Engert, B. Gilfix, B. Gottlieb, C. Haston, G. Hendy, A. Karaplis, R. Koenekoop, A. Peterson, F. Rauch, E. Skamene, M. Trifiro
Nephrology: I. Gupta
Obs.-Gyn.: R. Gagnon; A. Naumova
Pathology: A. Spatz
Pediatrics: P. Goodyer, N. Jabado, L. Majewska, J. Mitchell, A. Ryan
Psychiatry: R. Joobar, G. Turecki
Surgery: P. Roughley

11.9.5 Master of Science (M.Sc.); Human Genetics (Thesis) (45 credits)**Thesis Courses (33 credits)**

HGEN 680	(9)	M.Sc. Thesis Research 1
HGEN 681	(12)	M.Sc. Thesis Research 2
HGEN 682	(12)	M.Sc. Thesis Research 3

Required Courses (6 credits)

HGEN 662	(3)	Laboratory Research Techniques
HGEN 692	(3)	Human Genetics

Complementary Courses (6 credits)

6 credits chosen from the departmental offerings below or from 500-, 600-, or 700-level courses offered in the Faculties of Medicine or Science:

HGEN 660	(3)	Genetics and Bioethics
HGEN 661	(3)	Population Genetics
HGEN 663	(3)	Beyond the Human Genome
HGEN 670	(3)	Advances in Human Genetics 1
HGEN 671	(3)	Advances in Human Genetics 2
HGEN 672	(3)	Advances in Human Genetics 3
HGEN 690	(3)	Inherited Cancer Syndromes
HGEN 691	(3)	Host Responses to Pathogens
HGEN 693	(3)	Using Bioinformatics Resources
HGEN 694	(3)	Microarray Statistical Analysis
HGEN 695	(3)	Psychiatric Genetics
HGEN 696	(3)	Advanced Readings in Genetics 1
HGEN 697	(3)	Advanced Readings in Genetics 2
HGEN 698	(3)	Advanced Readings in Genetics 3
HGEN 699	(3)	Advanced Readings in Genetics 4

Note: The Graduate Advisory Committee may stipulate additional coursework at the 500, 600, or 700 level depending on the background of the candidate.

11.9.6 Master of Science (M.Sc.); Human Genetics (Thesis) — Bioinformatics (45 credits)**Thesis Courses (33 credits)**

HGEN 680	(9)	M.Sc. Thesis Research 1
HGEN 681	(12)	M.Sc. Thesis Research 2
HGEN 682	(12)	M.Sc. Thesis Research 3

Required Courses (6 credits)

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar
HGEN 692	(3)	Human Genetics

Complementary Courses (6 credits)

6 credits from the following courses:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics
PHGY 603	(3)	Systems Biology and Biophysics

Note: The Graduate Advisory Committee may stipulate additional coursework at the 500, 600, or 700 level depending on the background of the candidate.

11.9.7 Master of Science (M.Sc.); Human Genetics (Thesis) — Bioethics (45 credits)**Thesis Courses (30 credits)**

30 credits selected as follows:

HGEN 681	(12)	M.Sc. Thesis Research 2
HGEN 682	(12)	M.Sc. Thesis Research 3
HGEN 683	(6)	M.Sc. Thesis Research 4

Required Courses (12 credits)

12 credits from:

BIOE 680	(3)	Bioethical Theory
BIOE 681	(3)	Bioethics Practicum
HGEN 662	(3)	Laboratory Research Techniques
HGEN 692	(3)	Human Genetics

Complementary Courses (3 credits)

3 credits from the following:

BIOE 682	(3)	Medical Basis of Bioethics
CMPL 642	(3)	Law and Health Care
PHIL 543	(3)	Seminar: Medical Ethics
RELG 571	(3)	Religion and Medicine

11.9.8 Master of Science (M.Sc.); Genetic Counselling (Non-Thesis) (48 credits)

Revision, August 2012. Start of revision.

Required Courses (48 credits)

HGEN 600D1	(3)	Genetic Counselling Practicum
HGEN 600D2	(3)	Genetic Counselling Practicum
HGEN 601	(3)	Genetic Counselling Principles
HGEN 610D1	(3)	Genetic Counselling: Independent Studies
HGEN 610D2	(3)	Genetic Counselling: Independent Studies
HGEN 617	(3)	Principles of Medical Genetics
HGEN 620	(3)	Introductory Field Work Rotations

HGEN 621	(6)	Intro Field Work Rotations 2
HGEN 630D1	(6)	Advanced Field Work Rotations
HGEN 630D2	(6)	Advanced Field Work Rotations
HGEN 640	(3)	Second Year Practicum 1
HGEN 641	(3)	Second Year Practicum 2
PATH 653	(3)	Reading and Conference

Revision, August 2012. End of revision.

11.9.9 Doctor of Philosophy (Ph.D.); Human Genetics

Candidates entering Ph.D. 1 must complete at least three years of full-time resident study (six terms). The normal and expected duration of the Ph.D. program is four to five years. A student who has obtained a master's degree at McGill in a related field, or at an approved institution elsewhere, and is proceeding in the same subject toward a Ph.D. degree may, upon the recommendation of the Graduate Training Committee, enter at the Ph.D. 2 level.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (3 credits)

HGEN 692	(3)	Human Genetics
HGEN 701	(0)	Ph.D. Comprehensive Examination

Complementary Courses (15 credits)

(15 credits or 6 credits depending on admission status as described above.)

Courses are to be chosen from the list below and/or from among 500-, 600-, or 700-level courses offered in the Faculties of Medicine and Science.

HGEN 660	(3)	Genetics and Bioethics
HGEN 661	(3)	Population Genetics
HGEN 663	(3)	Beyond the Human Genome
HGEN 690	(3)	Inherited Cancer Syndromes
HGEN 691	(3)	Host Responses to Pathogens
HGEN 693	(3)	Using Bioinformatics Resources
HGEN 694	(3)	Microarray Statistical Analysis
HGEN 695	(3)	Psychiatric Genetics
HGEN 696	(3)	Advanced Readings in Genetics 1
HGEN 697	(3)	Advanced Readings in Genetics 2
HGEN 698	(3)	Advanced Readings in Genetics 3
HGEN 699	(3)	Advanced Readings in Genetics 4

Students are restricted to taking any two of the following courses:

HGEN 670	(3)	Advances in Human Genetics 1
HGEN 671	(3)	Advances in Human Genetics 2
HGEN 672	(3)	Advances in Human Genetics 3

Note: The Graduate Advisory Committee may stipulate additional coursework depending on the background of the candidate.

11.9.10 Doctor of Philosophy (Ph.D.); Human Genetics — Bioinformatics**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (6 credits)

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar
HGEN 692	(3)	Human Genetics
HGEN 701	(0)	Ph.D. Comprehensive Examination

Complementary Courses (6 credits)

* Two courses from the following:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics
PHGY 603	(3)	Systems Biology and Biophysics

* Note: Students who enter in Ph.D. 1 will need to take an additional 6 credits of complementary courses chosen from the departmental offerings listed for the Ph.D. in Human Genetics and/or from among 500-, 600-, or 700-level courses in the Faculties of Medicine or Science.

11.10 Medical Physics**11.10.1 Location**

Medical Physics Unit
 Montreal General Hospital
 Livingston Hall, Room L5-113
 1650 Cedar Avenue
 Montreal, QC H3G 1A4
 Canada

Telephone: 514-934-1934 ext. 44158

Fax: 514-934-8229

Email: mak@medphys.mcgill.ca

Website: www.medphys.mcgill.ca

11.10.2 About Medical Physics

The Medical Physics Unit offers an M.Sc. in Medical Radiation Physics. Facilities are available for students to undertake a Ph.D. in Medical Physics through the Department of Physics.

The Unit is a teaching and research unit concerned with the application of physics and related sciences in medicine, especially (but not exclusively) in radiation medicine; i.e., radiation oncology, medical imaging, and nuclear medicine.

The research interests of members of the Unit include various aspects of medical imaging, including 3D imaging, the development of new imaging modalities, and applications of imaging in radiation therapy; radiation dosimetry, solid state, electret, and NMR systems; nuclear cardiology; and applications of radiation biology to therapy.

The M.Sc. and Ph.D. programs in Medical Physics are accredited by the Commission on Accreditation of Medical Physics Education Programs, Inc., sponsored by the American Association of Physicists in Medicine (AAPM), the American College of Medical Physics (ACMP), the American College of Radiology (ACR), and the Canadian College of Physicists in Medicine (CCPM).

section 11.10.5: Master of Science (M.Sc.); Medical Radiation Physics (Thesis) (60 credits)

This two-year program provides a comprehensive introduction to the academic, research, and practical aspects of physics applied to radiation medicine. Students may go on to careers in clinical service as medical physicists in research-oriented hospital settings after clinical residency training; may consider development careers in industry in radiation therapy, diagnostic radiology, or nuclear medicine or nuclear energy; in governmental organizations as radiation safety experts, etc.; or pursue academic careers in university, industry, or government organizations. Our graduate programs are accredited by CAMPEP (Commission for Accreditation of Medical Physics Education Programs). Medical physicists must go through CAMPEP training (M.Sc. or Ph.D., followed by a residency training) to be eligible to sit certification exams. Certification is becoming a mandatory requirement for eligibility to practise in a clinical environment. The McGill M.Sc. program is research oriented, which has the additional advantage that the roads toward a Ph.D., followed by academic, industry, or clinical careers, are wide open. The practical and laboratory sections of the program are conducted in various McGill teaching hospitals.

The program comprises:

1. didactic courses in radiation physics, radiation dosimetry, the physics of nuclear medicine and diagnostic radiology, medical imaging, medical electronics and computing, radiation biology, and radiation hazards and protection;
2. seminars in radiation oncology, diagnostic radiology, and miscellaneous aspects of medical physics, e.g., lasers;
3. laboratory courses in radiation dosimetry and medical imaging;
4. an individual research thesis.

11.10.3 Medical Physics Admission Requirements and Application Procedures

11.10.3.1 Admission Requirements

Revision, October 2012. Start of revision.

Candidates applying to the M.Sc. program must normally hold a B.Sc. degree (honours or major) in Physics or Engineering, with a minimum overall GPA of 3.0/4.0 (minimum of 70%).

11.10.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

For information regarding the application procedure please go to the Medical Physics Unit admissions website at www.medphys.mcgill.ca and click on **Academic** and then **Admissions Information**.

Only complete applications will be considered. Applicants must either complete the "Applicant Statement" portion of the online application, or alternatively may submit a one-page Personal Statement as part of their supporting documentation.

Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit documented proof of competency in English by a TOEFL, iBT, or IELTS. The original test report must be sent by the testing centre, i.e., a photocopy sent by the applicant is not acceptable. The test must have been taken within the two years prior to date of application review, i.e., not prior to May 01, 2011. Applicants from some countries are exempt from providing evidence of English language proficiency. For more information, see www.mcgill.ca/gradapplicants/apply/prepare/requirements/proficiency.

11.10.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Applicants must either complete the "Applicant Statement" portion of the online application, or alternatively may submit a one-page Personal Statement.

11.10.3.3 Dates for Guaranteed Consideration

Students are admitted to the M.Sc. program only to start in the Fall term (in September) of a given academic year. Applications for consideration for the Fall term of 2013 must be completed by January 15, 2013.

Canadian	International	Special/Exchange/Visiting
Fall: Jan. 15	Fall: Jan. 15	Fall: Jan. 15
Winter: N/A	Winter: N/A	Winter: N/A
Summer: N/A	Summer: N/A	Summer: N/A

All supporting application materials should reach the Department by January 15, 2013.

Revision, October 2012. End of revision.

11.10.4 Medical Physics Faculty

Director

J.P.F. Seuntjens

Emeritus Professor

E.B. Podgorsak; Dipl.Ing.(Ljubljana), M.Sc., Ph.D.(Wisc.), F.C.C.P.M., F.A.A.P.M., D.A.B.M.P., D.A.B.R.

Professors

S.M. Lehnert; B.Sc.(Nott.), M.Sc., Ph.D.(Lond.)

G.B. Pike; B.Eng.(St. John's), M.Eng., Ph.D.(McG.)

J.P.F. Seuntjens; M.Sc., Ph.D.(Ghent), F.C.C.P.M., F.A.A.P.M

Associate Professor

I. El Naqa; B.Sc., M.S.(Jordan), Ph.D.(Chic.), M.A.(Wash.), D.A.B.R.

Assistant Professor

M.D.C. Evans; B.A.(Qu.), M.Sc.(McG.), F.C.C.P.M.

Lecturers

S. Davis, F. DeBlois, S. Devic, A. Gauvin, G. Hegyi, C. Janicki, J. Kildea, P. Léger, W.A. Parker, H.J. Patrocinio, R. Ruo, G. Stroian

Associate Members

A. Reader, R.B. Richardson, E. Soisson, N. Tomic, W. Wierzbicki

11.10.5 Master of Science (M.Sc.); Medical Radiation Physics (Thesis) (60 credits)

Thesis Courses (32 credits)

MDPH 625	(32)	M.Sc. Thesis Research
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Required Courses (28 credits)

MDPH 601	(3)	Radiation Physics
MDPH 602	(3)	Applied Dosimetry
MDPH 603	(2)	Laboratory Practicum 1
MDPH 607	(3)	Introduction to Medical Imaging
MDPH 608	(2)	Laboratory - Diagnostic Radiology and Nuclear Medicine
MDPH 609	(2)	Radiation Biology
MDPH 611	(2)	Medical Electronics
MDPH 612	(2)	Computers in Medical Imaging
MDPH 613	(2)	Health Physics
MDPH 614	(3)	Physics of Diagnostic Radiology
MDPH 615	(3)	Physics of Nuclear Medicine
MDPH 616	(1)	Selected Topics in Medical Physics

11.11 Medicine, Experimental

11.11.1 Location

Division of Experimental Medicine
 Department of Medicine
 Lady Meredith House, Room 101
 1110 Pine Avenue West
 Montreal, QC H3A 1A3
 Canada

Telephone: 514-398-3466

Fax: 514-398-3425

Email: experimental.medicine@mcgill.ca

Website: www.medicine.mcgill.ca/expmed

11.11.2 About Experimental Medicine

Experimental Medicine is a Division of the Department of Medicine charged with the task of providing graduate education in the Department, and enabling professors located in the research institutes of the McGill teaching hospitals and certain other centres to supervise graduate students. The Division offers various programs, each of which has different training objectives (see below). The international recognition of the high-quality training accorded our graduates is in essence what distinguishes graduates of our programs from the graduates of comparable programs in peer institutions.

section 11.11.5: Master of Science (M.Sc.); Experimental Medicine (Thesis) (45 credits)

Applicants for the M.Sc. in Experimental Medicine must hold either an M.D. degree or a B.Sc. degree, or the equivalent. The graduate training offered is wide-ranging and addresses experimental aspects of medicine in such diverse areas as endocrinology, hematology, cardiology, oncology, gastroenterology, genetics, and infectious diseases. This is a thesis program that may lead to careers in industry or serve as a stepping stone to further graduate studies.

section 11.11.6: Master of Science (M.Sc.); Experimental Medicine (Thesis) — Bioethics (45 credits)

Applicants for the M.Sc. (Bioethics Option) program must hold an M.D., Nursing, Physical and Occupational Therapy, and/or any other professional health training degree. Students who do not fit these criteria may be considered for admission on an individual basis. The objectives of this research-stream program are to allow students to conduct innovative research in relation to a bioethical issue pertinent to health care and to acquire a working knowledge of bioethical issues from the current viewpoint of other relevant disciplines such as law, philosophy, and religious studies. The curriculum is composed of required courses (6 credits) offered in the Biomedical Ethics Unit, Bioethics courses (6-credit minimum) offered by the base faculty or department and any graduate course required or accepted by a base faculty for the granting of a master's degree, for a total of 21 credits. A minimum of 45 credits is required including the thesis. The research culminates in the preparation of a thesis.

section 11.11.7: Master of Science (M.Sc.); Experimental Medicine (Thesis) — Environment (45 credits)

Applicants for the M.Sc. (Environment Option) must meet the requirements for the M.Sc. in Experimental Medicine as well as those set out by the McGill School of Environment (MSE) for their graduate option. Acceptability into the option will be based on a student's academic experience and performance, availability of an MSE-accredited supervisor or co-supervisor, the proposed research, and plans for funding as articulated by the supervisor(s). The Environment Option is aimed at students who wish to use interdisciplinary approaches in their graduate research on environmental issues and who wish to benefit from interactions that will occur as they are brought into contact with students from a wide range of disciplines through structured courses, formal seminars, and informal discussions and networking. The option in Environment provides students with an appreciation of the role of science in informing decision-making in the environment sector, and the influence that political, socio-economic, and ethical judgments have.

section 11.11.8: Master of Science (M.Sc.); Experimental Medicine (Thesis) — Family Medicine (45 credits)

Ideal candidates for the M.Sc. (Family Medicine Option) would be practising family physicians or family medicine residents interested in conducting research in family medicine. Exceptionally, candidates from different backgrounds may be considered, i.e., allied health professionals and undergraduate students with relevant research backgrounds. This program is the first of its kind in Canada because it teaches rigorous research skills to be successful researchers in the discipline of family medicine. It differs from the other programs in that it focuses on improving primary care delivery. All students are expected to complete a thesis to graduate. Graduates of this program may pursue careers in clinical or primary care research, government, or academia.

section 11.11.9: Doctor of Philosophy (Ph.D.); Experimental Medicine

Applicants for the Ph.D. in Experimental Medicine must normally hold an M.Sc. degree. The one exception is the possibility of direct entry offered to candidates having demonstrated academic excellence, i.e., a CGPA of 3.5 or more out of a possible 4.0 throughout their undergraduate studies. The training is in the conduct of research in a wide range of medical specialties. The method of instruction consists of a combination of in-class and practical training

section 11.11.9: Doctor of Philosophy (Ph.D.); Experimental Medicine

as well as exposure to international conferences and guest seminars. Success is ultimately determined by the preparation and defense of a thesis. This program may lead to research careers in industry, government, or academia.

section 11.11.10: Doctor of Philosophy (Ph.D.); Experimental Medicine — Environment

Applicants to the Ph.D. (Environment Option) must meet the same qualifications as those for the M.Sc. (Environment Option), the only difference being that they must hold an M.Sc. rather than simply a B.Sc. For further details, please see the section above regarding the M.Sc. (Environment Option).

section 11.11.11: Graduate Diploma in Clinical Research (30 credits)

The objectives of this program are to give students exposure to both theoretical and practical issues relevant to the conception and conduct of a clinical research study, as well as allowing them to put these principles in practice by participating in an ongoing clinical trial. The core element of the diploma is the Practicum in Clinical Research. It is an active "clerkship" or "intern/resident-type" participation in an ongoing clinical trial and/or research program. Six 1-credit workshops will be provided by experts in the academic, industrial, and government sectors, and cover wide-ranging issues pertinent to the conduct of clinical research. The training provided qualifies students to manage and design clinical research studies in both academic and industrial settings.

11.11.3 Medicine, Experimental Admission Requirements and Application Procedures**11.11.3.1 Admission Requirements**

Revision, October 2012. Start of revision.

M.Sc. or Ph.D. in Experimental Medicine

Admission to graduate studies and research in Experimental Medicine is no longer solely restricted to students who wish to register for the Ph.D. degree. Candidates who hold only an undergraduate degree in the medical and allied sciences (B.Sc. degree or an M.D. degree), must apply to the M.Sc. program, unless they have an undergraduate CGPA of 3.5 or more out of a possible 4.0, in which case they may apply for direct entry into the Ph.D. if they so desire. Candidates who already hold an M.Sc. apply directly to the Ph.D. program.

Admission is based on an evaluation by the Admissions Committee, which looks for evidence of high academic achievement, and on acceptance by a research director. It is the policy of the Division that all students must be financially supported either by their supervisor or through studentships or fellowships.

In addition to the documentation currently required by Graduate and Postdoctoral Studies, a letter from the candidate's research director outlining the M.Sc. or Ph.D. project is necessary.

M.Sc. (Bioethics Option)

Admission to the master's program in Bioethics, from the base discipline Medicine, shall be limited to students having degrees in Medicine, Nursing, or Physical and Occupational Therapy, as well as any other professional health training degree. Students who do not fit these criteria may be considered for admission on an individual basis.

For those who apply to the M.Sc. (Bioethics Option), the requirements, as well as the application Dates for Guaranteed Consideration, are different. For further information regarding this program, please refer to the Bioethics entry or visit their website at www.mcgill.ca/biomedicalethicsunit/masters.

M.Sc. (Environment Option)

For those applicants wishing to apply to the Master's program (Environment Option), it should be noted that, although the requirements and application Dates for Guaranteed Consideration remain the same, the student must remit additional documents that constitute their application to NOT ONLY the Division of Experimental Medicine, but ALSO to the McGill School of Environment. All the relevant information can be found on the School of Environment website at www.mcgill.ca/mse/programs/envroption.

The option of in-course addition of the Environment Option is also available to students in Experimental Medicine. For further information, students should refer to the departmental website or contact the Student Affairs Office.

M.Sc. (Family Medicine Option)

Ideal candidates for the M.Sc. (Family Medicine Option) are practising family physicians or family medicine residents interested in conducting research in family medicine. **Exceptionally**, candidates from different backgrounds may be considered (i.e., allied health professionals and undergraduate students with relevant research backgrounds). This program is the first of its kind in Canada because it teaches rigorous research skills for becoming successful researchers in the discipline of family medicine. It differs from the other programs in that it focuses on improving primary care delivery. All students are expected to complete a thesis to graduate. Graduates from this program may undertake careers in clinical or primary care research.

For those who apply to the M.Sc. (Family Medicine Option), the requirements, as well as the application deadline, are different. For further information regarding this program, please visit their website at: www.mcgill.ca/familymed/mastersprogram.

Graduate Diploma in Clinical Research

The Diploma program is open to health care and research professionals, medical residents, pharmacists, nurses, and those with an undergraduate degree in the medical and allied sciences.

11.11.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

11.11.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

M.Sc. and Ph.D. in Experimental Medicine

- Personal Statement
- Curriculum Vitae
- Acceptance by a research director
- Letter from the candidate's research director outlining the M.Sc. or Ph.D. project
- Additional documents (in the cases of the M.Sc. (Bioethics Option), the M.Sc. (Environment Option), and the M.Sc. (Family Medicine option))

11.11.3.3 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: June 30	Fall: April 30	Fall: Same as Canadian/International
Winter: Oct. 15	Winter: Aug. 31	Winter: Same as Canadian/International
Summer: N/A	Summer: N/A	Summer: N/A

Revision, October 2012. End of revision.

11.11.4 Medicine, Experimental Faculty

Chair, Department of Medicine

D. Eidelman

Director, Division of Experimental Medicine

H. Bennett

Emeritus Professors

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

B.E.P. Murphy; B.A., M.D.(Tor.), M.Sc., Ph.D.(McG.), F.A.C.P.(C)

Professors

M. Alaoui-Jamali; D.V.M.(Rabat, Morocco), Ph.D.(René-Descartes, Paris)

C. Autexier; B.Sc.(C'odia), Ph.D.(McG.)

A. Bateman; B.Sc., Ph.D.(Lond.)

G. Batist; B.Sc.(Col.), M.D.,C.M.(McG.), F.R.C.P.(C)

N. Beauchemin; B.A., B.Sc., M.Sc., Ph.D.(Montr.)

H. Bennett; B.A.(York, UK), Ph.D.(Brun.)

R. Blostein; M.Sc., Ph.D.(McG.)

A.E. Clarke; M.D.(Nfld.), M.S.(Stan.), F.R.C.P.(C)

M. Cosio; B.Sc.(Oviedo), M.D.(Madrid)

A. Cybulsky; M.D.(Tor.), F.R.C.P.(C)

D. Eidelman; M.D.,C.M.(McG.), F.R.C.P.(C)

A. Fuks; B.Sc., M.D.,C.M.(McG.)

J. Genest Jr.; M.D.,C.M.(McG.), F.R.C.P.(C)

A. Giaid; D.V.M.(Baghdad), M.D., Ph.D.(Lond.)

V. Giguere; B.Sc., Ph.D.(Laval)

M. Goldberg; B.Sc., M.Sc., Ph.D.(McG.)

Professors

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

S.A. Grover; B.A.(Roch.), M.D.,C.M.(McG.), M.P.A.(Harv.), F.R.C.P.(C)

Q.A. Hamid; M.D.(Mosul, Iraq.), Ph.D.(Lond.)

G. Hendy; B.Sc.(Sheff.), Ph.D.(Lond.)

J. Hiscott; B.Sc., M.Sc.(W. Ont.), Ph.D.(NYU)

L.J. Hoffer; B.Sc., M.D.,C.M.(McG.), Ph.D.(MIT)

S. Hussain; M.D.(Baghdad), Ph.D.(McG.)

A.C. Karaplis; B.Sc., M.D., Ph.D.(McG.)

L. Kleiman; B.Sc.(Ill.), Ph.D.(Johns Hop.)

R. Kremer; M.D., Ph.D.(Paris)

S. Lehnert; B.Sc.(Nottingham), M.Sc., Ph.D.(Lond.)

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

M.S. Ludwig; M.D.(Manit.), F.R.C.P.(C)

S. Magder; M.D.(Tor.), F.R.C.P.(C)

D. Malo; D.V.M., M.Sc.(Montr.), Ph.D.(McG.)

O.A. Mamer; B.Sc., Ph.D.(Windsor)

E. Marliss; M.D.(Alta.), F.R.C.P.(C)

J. Martin; B.Sc., M.B., B.Ch., M.D.(Cork), F.R.C.P.(C)

J. Milic-Emili; M.D.(Milan), F.R.S.C.

W.H. Miller; A.B.(Princ.), Ph.D.(Rock.), M.D.(C'nell)

W.J. Muller; B.Sc., Ph.D.(McG.)

A. Nepveu; B.Sc., M.Sc.(Montr.), Ph.D.(Sher.)

T. Nilsson; B.Sc., Ph.D.(Sweden)

L. Panasci; B.Sc., M.D.(G'town)

K. Pantopoulos; B.Sc., Ph.D.(Aristotelian, Greece)

V. Papadopoulos; D.Pharm.(Athens), Ph.D.(Paris)

M. Park; B.Sc., Ph.D.(Glas.)

A.C. Peterson; B.Sc.(Vic., BC), Ph.D.(Br. Col.)

B.J. Petrof; M.D.(Laval)

M.N. Pollak; M.D.,C.M.(McG.), F.R.C.P.(C)

P. Ponka; M.D., Ph.D.(Prague)

B. Posner; M.D.(Manit.), F.R.C.P.(C)

W.S. Powell; B.A.(Sask.), Ph.D.(Dal.)

S. Prakash; M.Sc., M.Tech., M.Phil.(India), Ph.D.(McG.)

S. Rabbani; M.B.B.S.(King Edward Med. Coll., Lahore)

D. Radzioch; M.Sc., Ph.D.(Jagiellonian, Cracow)

M. Rasminsky; B.A.(Tor.), M.D.(Harv.), Ph.D.(Lond.)

S. Richard; B.Sc., Ph.D.(McG.)

E. Schiffrin; M.D.(Argentina), Ph.D.(McG.)

E. Schurr; Diplom., Ph.D.(Al. Ludwigs U., Freiburg)

E. Skamene; M.D.(Charles U., Czech.), Ph.D.(Czech. Acad. of Sci.), F.R.C.P.(C), F.A.C.P.

A.D. Sniderman; M.D.(Tor.)

Professors

C. Srikant; M.Sc., Ph.D.(Madr.)
 M.M. Stevenson; B.A.(Hood), M.Sc., Ph.D.(Catholic U. of Amer.)
 D.M.P. Thomson; M.D.(W. Ont.), Ph.D.(Lond.), F.R.C.P.(C)
 M. Trifiro; B.Sc., M.D.,C.M.(McG.)
 C. Tsoukas; B.Sc.(McG.), M.Sc.(Hawaii), M.D.(Athens), F.R.C.P.(C)
 M. Wainberg; B.Sc.(McG.), Ph.D.(Col.)
 J. White; B.Sc., M.Sc.(Car.), Ph.D.(Harv.)
 S. Wing; B.Sc., M.Sc.(McG.)
 X.-J. Yang; B.Sc.(Zhejiang), Ph.D.(Shanghai)
 M. Zannis-Hadjopoulos; B.Sc., M.Sc., Ph.D.(McG.)
 H. Zingg; M.D.(Basel), Ph.D.(McG.)

Associate Professors

S. Ali; B.Sc.(C'dia), Ph.D.(McG.)
 D. Baran; M.D.,C.M.(McG.), F.R.C.P.(C)
 M. Behr; B.Sc.(Tor.), M.D.(Qu.), M.Sc.(McG.)
 N. Bernard; B.Sc.(McG.), Ph.D.(Duke)
 V. Blank; B.Sc., M.Sc.(Konstanz, Germany), Ph.D.(Inst. Pasteur)
 M. Blostein; M.D.,C.M.(McG.)
 L. Chalifour; B.Sc., Ph.D.(Manit.), M.A.(Harv.)
 S.R. Cohen; B.Sc., M.Sc., Ph.D.(McG.)
 D. Courmoyer; M.D.(Sher.), F.R.C.P.(C)
 M. Culty; B.Sc., M.Sc.(Lyon), Ph.D.(Grenoble)
 G. Di Battista; B.Sc.(C'dia), M.Sc., Ph.D.(Montr.)
 F. Doualla-Bell; B.Sc., M.S., Ph.D.(Paris XI)
 J.C. Engert; B.A.(Colby), Ph.D.(Boston)
 E. Fixman; B.Sc.(Col.), Ph.D.(Johns Hop.)
 B. Gagnon; M.D.(Laval), M.Sc.(McG.), F.R.C.P.(C)
 R. Gagnon; B.Sc.(Montr.), M.D.(Laval), D.Phil.(Oxf.)
 A. Gatignol; M.Sc., Ph.D.(Paul Sabatier)
 S.B. Gottfried; M.D.(Penn.)
 J. Henderson; B.Sc., Ph.D.(McG.)
 B. Jean-Claude; B.Sc., M.Sc.(Moncton), Ph.D.(McG.)
 P. Laneuville; B.Sc.(McM.), M.D.(Ott.), F.R.C.P.(C)
 S. Laporte; B.Sc., M.Sc., Ph.D.(Sher.)
 L. Larose; B.Sc., Ph.D.(Montr.)
 M. Laughrea; B.Sc.(Laval), M.Sc., M.Phil., Ph.D.(Yale)
 A.-M. Lauzon; B.Sc., M.Sc., Ph.D.(McG.)
 J.-J. Lebrun; B.Sc., M.Sc., Ph.D.(Rennes, France)
 L. Lecanu; M.Sc., Ph.D.(Paris)
 S. Lemay; M.D.(Montr.), F.R.C.P.(C)
 R. Lin; B.Sc., M.Sc.(PRC), Ph.D.(C'dia)

Associate Professors

M. Lipman; M.D.,C.M.(McG.), F.R.C.P.(C)
 J.-L. Liu; B.Sc., M.Sc.(Beijing), Ph.D.(McG.)
 J.A. Morais; M.D.(Montr.), F.R.C.P.(C)
 A. Mouland; B.A., B.Sc., Ph.D.(McG.)
 M. Newkirk; B.Sc., M.Sc.(Qu.), Ph.D.(Tor.)
 S. Qureshi; B.Sc., M.D.(Alta.), F.R.C.P.(C)
 J. Rauch; B.Sc., Ph.D.(McG.)
 J.-P. Routy; B.Sc., M.D., Ph.D.(France)
 G. Spurlin; B.Sc.(Med.), M.D.(Manit.)
 T. Takano; M.D., Ph.D.(Tokyo)
 P. Tonin; B.Sc., M.Sc., Ph.D.(Tor.)
 B. Turcotte; B.Sc., Ph.D.(Laval)
 B.J. Ward; M.D.,C.M.(McG.), M.Sc.(Oxf.), F.R.C.P.(C)

Assistant Professors

R. Aloyz; B.A., M.Sc., Ph.D.(Argentina)
 A. Baass; B.Sc.(McG.), M.D., M.Sc.(Montr.), F.R.C.P.(C)
 C. Baglolle; B.Sc., M.Sc.(PEI), Ph.D.(Calg.)
 M. Chevrette; B.Sc., M.Sc., Ph.D.(Laval)
 I. Colmegna; M.Sc.(Argentina)
 S. Daskalopoulou; M.D.(Athens)
 M. Divangahi; B.Sc.(McM.), Ph.D.(McG.)
 B. Gilfix; B.Sc.(Manit.), Ph.D.(W. Ont.), M.D.,C.M.(McG.), F.R.C.P.(C)
 C. Haston; B.Sc.(W. Ont.), M.Sc.(Tor.), Ph.D.(Texas)
 N. Johnson; B.Sc.(C'ida), M.D.(Ott.), Ph.D.(Br. Col.), F.R.C.P.(C)
 M. Kokoeva; B.Sc., Ph.D.(Russia)
 L. Koski; B.Sc.(Tor.), Ph.D.(McG.)
 A. Kristof; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)
 S. Lehoux; B.Sc.(Bishop's), Ph.D.(Sher.)
 C. Liang; B.Sc., Ph.D.(Nankai)
 B. Mazer; B.Sc.(Col.), M.D.,C.M.(McG.), F.R.C.P.(C)
 M. Murshed; M.Sc.(Brussels), Ph.D.(Cologne)
 E. Nashi; B.Sc., M.D.(Alta.), M.Sc.(McG.), Ph.D.(Northshore Medical Ctr.), F.R.C.P.(C)
 D. Nguyen; M.D.,C.M.(McG.), F.R.C.P.(C)
 M. Paliouras; B.Sc.(Tor.), M.Sc.(Flor.), Ph.D.(McG.)
 R. Rajan; B.Sc., M.D.(Manit.), M.Sc.(McM.)
 C. Rocheleau; B.A.(Assumption Coll.), Ph.D.(Mass.)
 S. Rousseau; B.Sc., M.Sc., Ph.D.(Laval)
 M. Saleh; B.Sc., M.Sc.(Beirut), Ph.D.(McG.)
 M. Sebag; B.Sc., Ph.D.(McG.), M.D.(Tor.), F.R.C.P.(C)
 C. Seguin; B.Sc.(McG.), M.D.(Montr.), F.R.C.P.(C)
 P. Siegel; B.Sc., Ph.D.(McM.)

Assistant Professors

R. Sladek; B.Sc., M.D.(Tor.), F.R.C.P.(C)

E. Torban; B.Sc., M.Sc.(Russia), Ph.D.(McG.)

Associate Members, McGill

B. Abdulkarim, A. Andermann, G. Bartlett, M. Basik, E. Bereza, J.D. Bobyn, D. Boivin, M. Bouchard, J. Bourbeau, P. Brodt, K. Brown, D.H. Burns, S. Chevalier, R.-C. Chian, H. Clarke, T. Coderre, T. Duchaine, D. Dufort, C. Ells, I.M. El Naqa, R. Farookhi, L. Ferri, K. Glass, C. Goodyer, P. Goodyer, W. Gotlieb, M. Götte, R. Grad, I. Gupta, J. Haggerty, M. Hunt, N. Jabado, M. Kaartinen, N. Kabani, J. Kimmelman, A. Koromilas, L. Lands, J. Lapointe, S.K. Law, C. Mandato, A. Macaulay, K. Mann, L. McCaffrey, C. McCusker, M. Meaney, T. Muanza, M. Nagano, J. Nalbantoglu, M. Ndao, F. Ni, C. O'Flaherty, A. Pause, H. Perrault, C. Piccirillo, P. Pluye, C. Polychronakos, J. Rak, C. Rodriguez, E. Rosenberg, A. Ryan, S. Sabri, G. Sant'Anna, R. Schirmmacher, R. Slim, N. Sonenberg, M. Sullivan, S.L. Tan, G. Tannenbaum, I. Topisirovic, M. Tremblay, J. Ursini-Siegel, M. Ware, M. Witcher, C. Wu, J.-H. Wu, M. Yaffe, G. Zogopoulos, J. Zwaagstra

Associate Members, Université de Montréal

J. Archambault, R. Butterworth, M. Cayouette, F. Charron, E. Cohen, J.-F. Côté, V. Dave, J. Davignon, C. Deal, A. Deng, C.F. Deschepper, C. Desrosiers, J.M. Di Noia, J. Drouin, J. Estall, H. Gu, J. Gutkowska, P. Hamet, Z. Hanna, P. Jolicoeur, A. Kania, M. Kmita, C. Lazure, E. Lecuyer, S. Mader, T. Moroy, M. Oeffinger, K. Podypanina, R. Rabasa-Lhoret, E. Racine, M. Raymond, T. Reudelhuber, M. Sairam, N. Seidah, R.-P. Sekaly, W.-K. Suh, J. Tremblay, M. Trudel, W.Y. Tsang, J. Vacher, A. Veillette

Associate Member, Pharmaceutical Companies

B. Gibbs

11.11.5 Master of Science (M.Sc.); Experimental Medicine (Thesis) (45 credits)**Thesis Courses (36 credits)**

24-36 credits selected from the following:

EXMD 690	(3)	Master's Thesis Research 1
EXMD 691	(6)	Master's Thesis Research 2
EXMD 692	(9)	Master's Thesis Research 3
EXMD 693	(12)	Master's Thesis Research 4
EXMD 694	(12)	Master's Thesis Research 5

Complementary Courses (21 credits)

9-21 credits of courses at the 500, 600, or 700 level chosen in consultation with the Supervisor. A minimum of 9 course credits is required for students entering the program with a bachelor's or M.D. degree.

11.11.6 Master of Science (M.Sc.); Experimental Medicine (Thesis) — Bioethics (45 credits)**Thesis Courses (24 credits)**

BIOE 690	(3)	M.Sc. Thesis Literature Survey
BIOE 691	(3)	M.Sc. Thesis Research Proposal
BIOE 692	(6)	M.Sc. Thesis Research Progress Report
BIOE 693	(12)	M.Sc. Thesis

Required Courses (6 credits)

BIOE 680	(3)	Bioethical Theory
BIOE 681	(3)	Bioethics Practicum

Complementary Courses (15 credits)

3 credits, one of the following:

BIOE 682	(3)	Medical Basis of Bioethics
CMPL 642	(3)	Law and Health Care
PHIL 543	(3)	Seminar: Medical Ethics
RELG 571	(3)	Religion and Medicine

12 credits, four 3-credit BIOE or EXMD graduate courses (500, 600, or 700 level) chosen in consultation with the Supervisor.

11.11.7 Master of Science (M.Sc.); Experimental Medicine (Thesis) — Environment (45 credits)**Thesis Courses (24 credits)**

EXMD 690	(3)	Master's Thesis Research 1
EXMD 692	(9)	Master's Thesis Research 3
EXMD 693	(12)	Master's Thesis Research 4

Required Courses (6 credits)

ENVR 610	(3)	Foundations of Environmental Policy
ENVR 650	(1)	Environmental Seminar 1
ENVR 651	(1)	Environmental Seminar 2
ENVR 652	(1)	Environmental Seminar 3

Complementary Courses (15 credits)

3 credits from one of the following courses*:

ENVR 519	(3)	Global Environmental Politics
ENVR 544	(3)	Environmental Measurement and Modelling
ENVR 620	(3)	Environment and Health of Species
ENVR 622	(3)	Sustainable Landscapes
ENVR 630	(3)	Civilization and Environment
ENVR 680	(3)	Topics in Environment 4

* or another course at the 500, 600, or 700 level recommended by the advisory committee and approved by the Environment Option Committee.

12 credits of courses at the 500, 600, or 700 level chosen in consultation with the student's academic supervisor.

11.11.8 Master of Science (M.Sc.); Experimental Medicine (Thesis) — Family Medicine (45 credits)**Thesis Courses (24 credits)**

EXMD 693	(12)	Master's Thesis Research 4
EXMD 694	(12)	Master's Thesis Research 5

Required Courses (18 credits)

DENT 672	(3)	Applied Mixed Methods in Health Research
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EPIB 507	(3)	Biostatistics for Health Professionals
EPIB 600	(3)	Clinical Epidemiology
FMED 500	(1)	Introduction to Research
FMED 600	(1)	Mixed Studies Reviews
FMED 601	(3)	Advanced Topics in Family Medicine Research
FMED 603	(1)	Introduction to Participatory Research in Health
PSYT 625	(3)	Qualitative Research in Health Care

Elective Courses (3 credits)

Three (3) credits, at the 500 level or higher (chosen in consultation with the student's academic adviser or supervisor.)

11.11.9 Doctor of Philosophy (Ph.D.); Experimental Medicine

A minimum of 12 course credits is required for students entering the program with a prior master's degree. Students having only a B.Sc. or M.D. degree and who have been either admitted directly or fast-tracked to the Ph.D. must complete a total of 18 credits. The following courses are highly recommended: EXMD 604D1/D2 Recent Advances in Cellular and Molecular Biology; EXMD 610 Biochemical Methods in Medical Research.

After consultation with their research supervisor and the Director of the Division, students may choose their courses from those offered by Experimental Medicine, Physiology, and Biochemistry, as well as other graduate and advanced undergraduate courses in the medical and allied sciences. Where necessary, students may enrol for credit in courses offered in the physical and mathematical sciences.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses

EXMD 701D1	(0)	Comprehensive Oral Examination
EXMD 701D2	(0)	Comprehensive Oral Examination

Complementary Courses (18 credits)

(12-18 credits)

A minimum of 12 course credits is required for students entering the program with a prior master's degree. Students having been fast-tracked to the Ph.D. must complete a total of 18 credits (9 credits in addition to the 9 which were originally requested upon entry into the M.Sc. program).

11.11.10 Doctor of Philosophy (Ph.D.); Experimental Medicine — Environment**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (6 credits)

ENVR 610	(3)	Foundations of Environmental Policy
ENVR 650	(1)	Environmental Seminar 1
ENVR 651	(1)	Environmental Seminar 2
ENVR 652	(1)	Environmental Seminar 3
EXMD 701D1	(0)	Comprehensive Oral Examination
EXMD 701D2	(0)	Comprehensive Oral Examination

Complementary Courses (12 credits)

(6-12 credits)

One of the following courses:*

ENVR 519	(3)	Global Environmental Politics
ENVR 544	(3)	Environmental Measurement and Modelling
ENVR 620	(3)	Environment and Health of Species
ENVR 622	(3)	Sustainable Landscapes
ENVR 630	(3)	Civilization and Environment
ENVR 680	(3)	Topics in Environment 4

* or another course at the 500, 600, or 700 level recommended by the advisory committee and approved by the Environment Option Committee.

One to three courses at the 500, 600, or 700 level chosen in consultation with the student's academic supervisor.

11.11.11 Graduate Diploma in Clinical Research (30 credits)

The core element of the diploma is the Practicum in Clinical Research. It is a six-step program with active “clerkship” or “intern/resident type” participation in each component that is essential to the successful development and evaluation of a clinical trial.

Required Courses (6 credits)

EXMD 617	(1)	Workshop in Clinical Trials 1
EXMD 618	(1)	Workshop in Clinical Trials 2
EXMD 619	(1)	Workshop: Clinical Trials 3
EXMD 620	(1)	Clinical Trials and Research 1
EXMD 625	(1)	Clinical Trials and Research 2
EXMD 626	(1)	Clinical Trials and Research 3

Complementary Courses (6 credits)

Two courses chosen from: Experimental Medicine (EXMD), Pharmacology and Therapeutics (PHAR), Epidemiology and Biostatistics (EPIB). With approval, courses from other Allied Health Sciences departments may be considered.

Required Practicum (18 credits)

EXMD 627	(18)	Practicum in Clinical Research
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11.12 Medicine, Family (Option)**11.12.1 Location**

Department of Family Medicine
 515-517 Pine Avenue West
 Montreal, Quebec H2W 1S4
 Telephone: 514-398-7375
 Fax: 514-398-4202
 Email: graduateprogrms.fammed@mcgill.ca
 Website: www.mcgill.ca/familymed/mastersprogram

11.12.2 About Family Medicine

The Department of Family Medicine at McGill University has been in existence since the late 1970s. Through the efforts of dedicated and committed faculty members, our department has gained provincial, national, and international renown for its programs. We have graduated over 1,000 family physicians who are working in urban and rural settings around the world. Health Care Reform in Canada has placed the discipline of Family Medicine at the centre of health care delivery. Family physicians have the responsibility to ensure that every individual receives continuous and comprehensive care. The Department of Family Medicine is an academic department composed of health care professionals dedicated to teaching, research, service, and the advancement of the discipline of Family Medicine, locally, nationally, and internationally.

The McGill Department of Family Medicine has the mandate to:

- Provide progressive undergraduate and postgraduate education
- Develop CME programs to address changes in the health care system
- Conduct health services research to assess the impact of reform on population health

11.12.3 Medicine, Family (Option) Admission Requirements and Application Procedures

11.12.3.1 Admission Requirements

Revision, October 2012. Start of revision.

The Family Medicine Option program is open to family physicians practising in Quebec interested in conducting research in family medicine. Exceptionally, we may consider candidates with a different background, such as allied health professionals, and undergraduate students across disciplines wanting to undertake research relevant to family medicine. In this case, you may be considered for admission on an individual basis and should contact the [Program Coordinator](#) to discuss eligibility.

What do we look for?

High academic achievement: A cumulative grade point average (CGPA) of 3.4 is required out of a possible maximum CGPA of 4.0 or a GPA of 3.6 is required in the last two years of full-time studies.

Proof of competency in oral and written English: TOEFL: International students who have not received their instruction in English or whose mother tongue is not English must pass the Test of English as a Foreign Language (TOEFL) with a minimum score of 567 (paper-based test) or 86, with each component score not less than 20 (Internet-based test). The TOEFL institution code for McGill University is 0935. Alternatively, students may submit International English Language Testing System (IELTS) scores with a minimum overall band score of 6.5. Original score reports must be submitted (photocopies will not be accepted). For further information, please refer to the [TOEFL](#) website.

For overseas graduates, an attempt is made to situate the applicant's academic grades among the standards of their universities. Grades are, however, converted to their McGill equivalent. Conversion charts, as well as required admission documentation for each country, are provided by Graduate and Postdoctoral Studies ([GPS](#)) and prospective students should refer to these in order to determine if they are admissible to our program.

11.12.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

Supervisor: You must have met and confirmed a supervisor before the application process can commence. Please contact the [Program Coordinator](#) by **March 1st** to ensure that you have a supervisor. Prior to processing any admission, we require each file to contain a completed [Confirmation of Supervisor Form](#), signed by the proposed supervisor and student. Once the supervisor has been confirmed, the student will need to provide a 1–2 page Project Description of the proposed research.

After the Department of Family Medicine has informed the student that they have passed the first level of approval and that they have been successfully matched up with a supervisor, they are then required to apply officially with the Division of Experimental Medicine and Graduate and Postdoctoral Studies.

Application checklist: This [CHECKLIST](#) should be submitted at the time of application.

Curriculum Vitae: Please provide a resumé, which should include a statement of research interests as well as a listing of previous research experience and publications, if applicable.

Letters of Reference: Two (2) letters of reference, as well as an [Applicant Evaluation Form](#) completed by each referee must accompany any application to our program. These letters must be current (not more than six months old) and must be uploaded directly to McGill by the referee. Applicants are encouraged to request references from academic or other professional employers who can evaluate their potential for graduate studies and research, and who can attest to the applicant's abilities and aptitudes. Please note that these should not be the proposed supervisor. *Any applicant having undertaken previous graduate studies (whether at McGill or elsewhere) should make sure that one of the letters of reference is from their graduate supervisor.*

Personal Statement: Applicants must submit a personal statement in which they describe their background, research interests, and reasons for wishing to undertake the desired program. The statement should be no more than two (2) pages long.

11.12.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- [Applicant Evaluation Form](#) completed by each referee

- [Application Checklist](#)
- [Confirmation of Supervisor Form](#), signed by the proposed supervisor and student.
- Curriculum Vitae
- Personal Statement – no more than two (2) pages long
- Research Proposal

11.12.3.3 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: March 15	Fall: March 15	Fall: N/A
Winter: N/A	Winter: N/A	Winter: N/A
Summer: N/A	Summer: N/A	Summer: N/A

All supporting documents must be received by March 15th. Admissions are for September only.

Revision, October 2012. End of revision.

11.12.4 Medicine, Family (Option) Faculty

Chair

Miriam Boillat (*Interim*)

Graduate Program Director

Gillian Bartlett

Professors

Ann Macaulay; M.B., Ch.B.(St. And.), C.C.F.P.

Mark Yaffe; B.Sc., M.D.,C.M.(McG.), M.Cl.Sc.(W. Ont.)

Associate Professors

Gillian Bartlett; B.Sc., M.Sc., Ph.D.(McG.)

Eugene Bereza; B.A., M.D.,C.M.(McG.), C.C.F.P.

Miriam Boillat; M.D.,C.M.(McG.), F.R.C.P(C)

Roland Grad; M.D.,C.M.(McG.), M.Sc.(McM.), C.C.F.P.

Jeannie Haggerty; B.Sc.(S. Fraser), M.Sc., Ph.D.(McG.)

Susan Law; B.Sc.(Guelph), M.H.Sc.(Tor.), Ph.D.(Lond.)

Charo Rodriguez; M.D.(Alicante), M.P.H.(Valencia), Ph.D.(Montr.)

Ellen Rosenberg; B.A.(Smith), M.D.,C.M.(McG.), C.C.F.P.

Pierre Pluye; M.D.(P. Sabatier), M.Sc., Ph.D.(Montr.)

Mark Ware; B.A.(Qu.), M.B., B.S(W. Indies), M.Sc.(Lond.)

Assistant Professor

Anne Andermann; B.Sc. M.D.,C.M.(McG.), M.Phil.(Camb.), D.Phil.(Oxf.), C.C.F.P., F.R.C.P.(C), F.F.P.H.(UK)

11.13 Microbiology and Immunology

11.13.1 Location

Department of Microbiology and Immunology

3775 University Street
Montreal, QC H3A 2B4
Canada

Telephone: 514-398-3061

Fax: 514-398-7052

Email: grad.microimm@mcgill.ca

Website: www.mcgill.ca/microimm

11.13.2 About Microbiology and Immunology

The Department offers graduate programs leading to the degrees of M.Sc. and Ph.D. Each program is tailored to fit the needs and backgrounds of individual students. The graduate program is designed to offer students state-of-the-art training, concentrating on four key areas of research: cellular and molecular immunology, microbial physiology and genetics, molecular biology of viruses, and medical microbiology. Basic research discoveries in microbiology may lead to improved drug design and vaccine development to treat and prevent diseases. The Department has many notable facilities and resources, including a cell sorter, ultra centrifuges, confocal microscope, real-time PCR facilities, cryostat for immunocytochemistry, and facilities for radio-isotope studies and infectious diseases. We foster close ties with McGill's teaching hospitals and research centres to promote multidisciplinary research.

section 11.13.5: Master of Science (M.Sc.); Microbiology and Immunology (Thesis) (45 credits)

The primary goal of this program is to provide students with unique opportunities to learn experimental designs and fundamental research techniques, and objectively synthesize information from scientific literature. These tools enable the students to focus on major research topics offered by the Department: molecular microbiology, mycology, microbial physiology, virology, genetics, immunology, drug design, and aspects of host-parasite relationships. Each M.Sc. student chooses their preferred major research area and research supervisor. Following an interview, the student is presented with a research topic and offered a studentship (amounts vary). Each student then must register for our graduate courses (two seminars, two reading and conference courses, and three current topics). If pertinent to the student's research program, the research adviser may advise the student to take additional courses. Most of our students, after one year, are proficient researchers, and some first author of a research publication. About 70% of the M.Sc. students elect to enter into our Ph.D. program. The remaining students advance their microbiology background by opting to enter into medicine, epidemiology, biotechnology, or pharmaceutical disciplines.

section 11.13.6: Doctor of Philosophy (Ph.D.); Microbiology and Immunology

The primary goal of the Ph.D. program is to create a self-propelled researcher, proficient in experimental designs and advanced methodologies applicable to the varied and rapidly changing disciplines in microbiology and immunology. Close research supervision and bi-weekly laboratory sessions impart the requisite research discipline and objective assessment of acquired or published research data. A Ph.D. student, if promoted from our M.Sc. program, without submitting the thesis, is required to register for one graduate seminar and one reading and conference course, but the bulk of his/her time is devoted to research. Other requirements include a yearly presentation of the accumulated research data to the Ph.D. supervisory committee, successfully clearing the Ph.D. comprehensive examination, two years after registration into the Ph.D. program, and finally submission of a thesis. The research theme must be original, and the acquired data and hypothesis must be defended orally by the student. Each student receives a stipend for the entire duration and a minimum six-semester residency is required for the completion of the program.

11.13.3 Microbiology and Immunology Admission Requirements and Application Procedures

11.13.3.1 Admission Requirements

Revision, October 2012. Start of revision.

Master's

Candidates are required to hold a B.Sc. degree in microbiology and immunology, biology, biochemistry, or another related discipline; those with the M.D., D.D.S., or D.V.M. degrees are also eligible to apply. The minimum grade point average for acceptance into the program is 3.2 (out of 4.0). Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit documented proof of competency in oral and written English. Before acceptance, appropriate exam results must be submitted directly from the TOEFL (Test of English as a Foreign Language) or IELTS (International English Language Testing Systems) Office. An institutional version of the TOEFL is not acceptable. Applications will not be considered if a TOEFL or IELTS test result is not available.

The Test of English as a Foreign Language (TOEFL):

- Paper-Based Test (PBT): a minimum score of 575
- Internet-Based Test (iBT): a minimum overall score of 95
- The International English Language Testing System (IELTS): a minimum overall band score of 7.0

The TOEFL Institution Code for McGill University is 0935.

Ph.D.

Students who have satisfactorily completed an M.Sc. degree in microbiology and immunology, a biological science, or biochemistry, or highly qualified students enrolled in the departmental M.Sc. program, may be accepted into the Ph.D. program provided they meet its standards.

11.13.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

All applicants are encouraged to approach academic staff members during or before the application process since no applicants are accepted without a supervisor.

11.13.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Letter from a prospective supervisor

11.13.3.3 Dates for Guaranteed Consideration

All applications and documents must be submitted by the Dates for Guaranteed Consideration.

Canadian	International	Special/Exchange/Visiting
Fall: June 1	Fall: March 15	Fall: Same as Canadian/International
Winter: Sept. 15	Winter: Sept. 15	Winter: Sept. 15
Summer: Jan. 15	Summer: Jan. 15	Summer: Jan. 15

Revision, October 2012. End of revision.

11.13.4 Microbiology and Immunology Faculty

Chair

J. Madrenas

Emeritus Professor

R.A. MacLeod

Professors

A. Berghuis; M.Sc.(The Netherl.), Ph.D.(Br. Col.)
 J.W. Coulton; B.Sc.(Tor.), M.Sc.(Calg.), Ph.D.(W. Ont.)
 J. Madrenas; M.D.(Barcelona), M.Sc., Ph.D.(Alta.)
 G.J. Matlashewski; B.Sc.(C'dia), Ph.D.(Ohio)
 R.A. Murgita; B.Sc.(Maine), M.S.(Vermont), Ph.D.(McG.)
 M. Olivier; B.Sc.(Montr.), Ph.D.(McG.)
 M.A. Wainberg; B.Sc.(McG.), Ph.D.(Col.)

Associate Professors

D.J. Briedis; B.A., M.D.(Johns Hop.)
 B. Cousineau; B.Sc., M.Sc., Ph.D.(Montr.)
 S. Fournier; Ph.D.(Montr.)
 M. Gotte; Ph.D.(Max Planck)
 H. Le Moual; Ph.D.(Montr.)
 G. T. Marczynski; B.Sc., Ph.D.(Ill.)
 C. Piccirillo; B.Sc., Ph.D.(McG.)
 D. Sheppard; M.D.(Tor.)

Associate Professors

S. Vidal; Ph.D.(Geneva)

Assistant Professors

J. Fritz; Ph.D.(Vienna)

S. Gruenheid; B.Sc.(Br. Col.), Ph.D.(McG.)

C. Krawczyk; Ph.D.(Tor.)

Associate Members*Human Genetics:* P. Gros*Institute of Parasitology:* F. Dziarsinski, A. Jardim, M. Ndao, P. Ribeiro, P. Rohrbach, J. Zhang*Medicine:* M. Behr, I. Colmegna, A. Finzi, S. Hussain, A. Kristof, C. Liang, V. Loo, A. Manges, M.A. Miller, J. Nadeau, M. Newkirk, K. Pantopoulos, J.E. Rauch, M. Reed, M. Saleh, M. Tremblay, C. Tsoukas, B. Turcotte, B.J. Ward*Microbiology and Immunology:* L. Kleiman*Neuroimmunology:* A. Bar-Or*Neurology and Neurosurgery:* J. Antel*Oncology:* A. Gatignol, A.E. Koromilas, A. Mouland, S. Richard*Ophthalmology:* M. Burnier*Surgery:* N.V. Christou**Adjunct Professors**

J. Archambault

A. Descoteaux

T.D. Jones

G. Kukolj

P. Lau

B. Lee

S-L. Liu

A. Makrigiannis

A.M. Matte

C. Rioux

W.-K. Suh

D. Ziberstein

11.13.5 Master of Science (M.Sc.); Microbiology and Immunology (Thesis) (45 credits)**Thesis Courses (24 credits)**

MIMM 697	(8)	Master's Research 1
MIMM 698	(8)	Master's Research 2
MIMM 699	(8)	Master's Research 3

Required Courses (15 credits)

MIMM 611	(3)	Graduate Seminars 1
MIMM 612	(3)	Graduate Seminars 2

MIMM 613	(3)	Current Topics 1
MIMM 614	(3)	Current Topics 2
MIMM 615	(3)	Current Topics 3

Complementary Courses (6 credits)

6 credits, two of the following courses:

MIMM 616	(3)	Reading and Conference 1
MIMM 617	(3)	Reading and Conference 2
MIMM 618	(3)	Reading and Conference 3
MIMM 619	(3)	Reading and Conference 4

Other courses may be required to strengthen the student's background.

11.13.6 Doctor of Philosophy (Ph.D.); Microbiology and Immunology**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (18 credits)

MIMM 611	(3)	Graduate Seminars 1
MIMM 612	(3)	Graduate Seminars 2
MIMM 613	(3)	Current Topics 1
MIMM 614	(3)	Current Topics 2
MIMM 615	(3)	Current Topics 3
MIMM 701	(0)	Comprehensive Examination-Ph.D. Candidate
MIMM 713	(3)	Graduate Seminars 3

Complementary Courses (12 credits)

(Minimum of 12 credits)

Three courses from List A and a minimum of three consecutive courses from List B.

List A:

MIMM 616	(3)	Reading and Conference 1
MIMM 617	(3)	Reading and Conference 2
MIMM 618	(3)	Reading and Conference 3
MIMM 619	(3)	Reading and Conference 4

List B:

MIMM 721	(1)	Ph.D. Research Progress Report 1
MIMM 722	(1)	Ph.D. Research Progress Report 2
MIMM 723	(1)	Ph.D. Research Progress Report 3
MIMM 724	(1)	Ph.D. Research Progress Report 4

Other courses may be required to strengthen the student's background.

11.14 Neuroscience (Integrated Program in)

11.14.1 Location

Montreal Neurological Institute, Room 141
3801 University Street
Montreal, QC H3A 2B4
Canada

Telephone: 514-398-1229 / 514-398-6243 / 514-398-1905

Fax: 514-398-4621

Email: ipn@mcgill.ca or ipn.admissions@mcgill.ca

Website: www.mcgill.ca/ipn

11.14.2 About the Integrated Program in Neuroscience

Montreal is home to the largest concentration of neuroscientists in North America. Neuroscience research at McGill University is internationally renowned, and its Integrated Program in Neuroscience (IPN) provides graduate training in this outstanding research environment. With approximately 340 M.Sc. and Ph.D. students and more than 160 supervisors, the IPN is the largest graduate program in the Faculty of Medicine and one of the largest neuroscience graduate programs in North America. Neuroscience training within the IPN spans the full spectrum of research fields, from cellular and molecular neuroscience to behavioural and cognitive neuroscience. In addition to laboratory research, the IPN offers an extensive range of courses, hosts an annual Neuroscience Retreat, and maintains a seminar program to facilitate communication between students in different neuroscience disciplines. Neuroscience trainees from McGill have gone on to successful careers in academia and industry.

A prospective graduate student may identify a supervisor from one of several research streams, spanning the full spectrum of neuroscience research. A student with a bachelor's degree may apply to the M.Sc. program; it is common to transfer to the Ph.D. program if suitable progress is made. Students with M.Sc. degrees may apply directly to the Ph.D. program. As of 2010, IPN also offers a Ph.D. Rotation program each September.

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 (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 review the written proposal and communicate its recommendations to the student.
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 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.
5. The Graduate Program Committee has instituted a mentorship program by which each student will be matched with a specific member of the Committee. The Program Mentor ensures that the student, the supervisor(s), and other members of the Advisory Committee are aware of and meet key milestones, in a timely manner, throughout the course of the student's graduate study.
6. An M.Sc. student may be eligible to transfer to the Ph.D. program without submitting a master's thesis by taking the Transfer Seminar/Candidacy Exam. This exam is allowable if the master's CGPA is 3.3 or higher and if the student's Advisory Committee recommends the student as an appropriate candidate for Ph.D. studies. M.Sc. students who wish to pursue a Ph.D. degree, but who have not obtained the minimum 3.3 CGPA in their M.Sc. coursework while in the IPN, must submit a master's thesis and apply for the Ph.D. level afterwards.
7. All incoming students are required to take the workshops on Responsible Conduct of Research. These will be included as part of the milestones for annual progress reports.

section 11.14.5: Master of Science (M.Sc.); Neuroscience (Thesis) (45 credits)

The M.Sc. program offers opportunities to a wide diversity of individual interests and backgrounds, and prepares our students for scientific careers in neuroscience and related fields. Programs leading to an M.Sc. degree require the completion of 45 credits of academic and research training. Applicants must hold an undergraduate degree, or its equivalent, from a recognized institution and must display an adequate background in basic sciences. Applicants are expected to have attained a high scholastic standing equal to, or greater than, the minimum cumulative grade point average (CGPA) of 3.3 (out of 4.0 at McGill University) in all levels of study.

section 11.14.6: Doctor of Philosophy (Ph.D.); Neuroscience

The IPN offers a highly competitive Ph.D. degree program that prepares students for successful scientific careers in the field of neuroscience. Over half of the students registered in the neuroscience graduate program at McGill University are in the doctoral stream. Applicants must hold a graduate-level degree in a field related to neuroscience or have an M.D. degree, preferably with postgraduate training. Applicants will also be considered for admission if enrolled in the M.D.-Ph.D. program through the Faculty of Medicine at McGill University. Students currently registered in the Master's program in neuroscience may be permitted to transfer to the Ph.D. program without submitting a master's thesis. Applicants are expected to have attained a high scholastic standing equal to, or greater than, the minimum cumulative grade point average of 3.3 (out of 4.0 at McGill University) in all levels of study. In exceptional circumstances, students MAY enter the Ph.D. program directly from their undergraduate degree if a CGPA of 3.7 is attained and if the student already presents extensive research experience.

11.14.3 Neuroscience (Integrated Program in) Admission Requirements and Application Procedures**11.14.3.1 Admission Requirements**

Revision, October 2012. Start of revision.

General

The applicant must 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 (CGPA) of 3.0 out of a possible 4.0 is required by Graduate and Postdoctoral Studies; however, the IPN prefers applicants to show a higher academic standing, and requires a minimum CGPA of 3.3.

Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit results of the TOEFL exam with their application and have a minimum score of 600 on the paper-based test (86 on the Internet-based test with each component score not less than 20).

M.Sc. Degree

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

Ph.D. Degree

Applicants must hold a master's degree in a field related to neuroscience, or an M.D. degree with postgraduate training.

Students currently registered in the master's program in neuroscience may be permitted to transfer to the Ph.D. program.

Applicants are expected to have a high academic standing in their previous academic studies and research.

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 coursework required to complete the training deemed necessary for the degree sought. These decisions become an integral part of the graduation requirements for the student.

11.14.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

11.14.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Curriculum Vitae
- Personal Statement

11.14.3.3 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: June 1	Fall: March 15	Fall: Same as Canadian/International
Winter: Oct. 15	Winter: Sept. 15	Winter: Same as Canadian/International
Summer: N/A	Summer: N/A	Summer: N/A

Revision, October 2012. End of revision.

11.14.4 Neuroscience (Integrated Program in) Faculty**Director**

J. Nalbantoglu

Associate Director

D. Ragsdale

Administrator

J. Makkerh

Emeritus Professors

B. Collier; Ph.D., Dept. of Pharmacology

M. Diksic; Ph.D., Dept. of Neurology and Neurosurgery

C. Thompson; D.Sc., F.C.C.P.M., Dept. of Neurology and Neurosurgery

Professors

A. Aguayo; M.D.(Cordoba Natn.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery

G. Almazan; B.Sc.(N'eastern), Ph.D.(McG.), Dept. of Pharmacology and Therapeutics

E. Andermann; M.D.,C.M., M.Sc., Ph.D.(McG.), F.C.C.M.G., Dept. of Neurology and Neurosurgery

F. Andermann; B.A.(Paris), B.Sc.(McG.), M.D.(Montr.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery

J. Antel; M.D., B.Sc.(Manit.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery

D. Arnold; B.Sc., M.D.(C'nell), F.R.C.P.(C) (*James McGill Professor*), Dept. of Neurology and Neurosurgery

M. Avoli; M.D.(Rome), Ph.D.(McG.), Dept. of Neurology and Neurosurgery

C. Baker; Ph.D.(Calif.), Dept. of Ophthalmology

P. Barker; Ph.D.(Alta.), B.Sc.(S. Fraser), Dept. of Neurology and Neurosurgery

S. Baum; Ph.D.(Brown), School of Communication Sciences and Disorders

C. Benkelfat; M.D., C.S.P.Q., D.E.R.B.H., Dept. of Psychiatry

G. Bennett; Ph.D.(Virg. Commonwealth), Dept. of Anaesthesia

P. Boksa; Ph.D.(McG.), Dept. of Psychiatry

C. Bourque; B.Sc.(Ott.), Ph.D.(McG.), Dept. of Neurology and Neurosurgery

P. Braun; Ph.D.(Calif., Berk.), Dept. of Biochemistry

J.C.S. Breitner; M.D.(Pennsylvania), MPH (Johns Hop.), Dept. of Psychiatry

C. Bushnell; Ph.D.(Amer.), Dept. of Anaesthesia

S. Carbonetto; M.Sc.(Mass.), Ph.D.(N. Carolina), Dept. of Neurology and Neurosurgery

F. Cervero; M.D., Ph.D.(Madrid), D.Sc.(Edin.), Dept. of Anaesthesia

H. Chertkow; M.D.(W. Ont.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery

P. Clarke; Ph.D.(Lond.), Dept. of Pharmacology and Therapeutics

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S. David; Ph.D.(Manit.), Dept. of Neurology and Neurosurgery

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H. Durham; M.Sc.(W. Ont.), Ph.D.(Alta.), Dept. of Neurology and Neurosurgery

S. El Mestikawy; Ph.D.(Univ. Pierre et Marie Curie), Dept. of Psychiatry

Professors

A. Evans; M.Sc.(Sur.), Ph.D.(Leeds), Dept. of Neurology and Neurosurgery

C. Flores; Ph.D.(C' dia), Dept. of Psychiatry

E. Frombonne; M.D.(Paris V), M.Sc.(Paris), Dept. of Psychiatry

S.G. Gauthier; B.A., M.D.(Montr.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery

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F. Kingdom; Ph.D.(Reading), Dept. of Ophthalmology

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 G. Turecki; M.D.(Brazil), Ph.D.(McG.), Dept. of Psychiatry
 C.-D. Walker; Ph.D.(Geneva), Dept. of Psychiatry
 C. Wolfson; Ph.D.(McG.), Dept. of Epidemiology and Biostatistics
 R.J. Zatorre; A.B.(Boston), M.Sc., Ph.D.(Brown), Dept. of Neurology and Neurosurgery

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 D. Bowie; Ph.D.(Lond.), Dept. of Pharmacology and Therapeutics
 A. Brunet; Ph.D.(Montr.), Dept. of Psychiatry
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 T. Coderre; Ph.D.(McG.), Dept. of Anaesthesia
 L. Collins; M.Eng., Ph.D.(McG.), Dept. of Neurology and Neurosurgery
 E. Cook; B.Sc.(Ariz. St.), M.Sc.(Rice), Ph.D.(Baylor), Dept. of Physiology
 A. Dagher; M.Eng.(McG.), M.D.(Tor.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery
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 K. Nader; B.Sc., Ph.D.(Tor.), Dept. of Psychology
 J. Nalbantoglu; B.Sc., Ph.D.(McG.), Dept. of Neurology and Neurosurgery
 H. Paudel; Ph.D.(Okla.), M.Sc.(Nepal), Dept. of Neurology and Neurosurgery
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 A. Raz; M.Sc., Ph.D.(Hebrew), Dept. of Psychiatry
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 B. Bedell; B.S.(Leigh), M.D., C.M.(McG.), Ph.D.(Texas), Dept. of Neurology and Neurosurgery
 F. Bedford; Ph.D.(Lond.), Dept. of Anatomy and Cell Biology
 M. Brodeur; Ph.D.(McM.), Dept. of Psychiatry
 M.J. Chacron; B.Sc., Ph.D.(Ott.), Dept. of Physiology
 B. Chen; Ph.D.(SUNY), Dept. of Neurology and Neurosurgery
 Y. Chudasama; B.Sc., Ph.D.(Cardiff), Dept. of Psychology
 C. Ernst; B.Sc.(McG.), M.Sc.(Br. Col.), Ph.D.(McG.), Dept. of Psychiatry
 R. Farivar; B.Sc.(Vic., BC), Ph.D.(McG.), Dept. of Ophthalmology
 C. Flores; Ph.D.(C' dia), Dept. of Psychiatry
 Y. Goto; Ph.D.(Albany Med. Coll.), Dept. of Psychiatry
 R. Gruber; Ph.D.(Tel Aviv), Dept. of Psychiatry
 P. Haghighi; Ph.D.(McG.), Dept. of Physiology
 K.L. Hyde; Ph.D.(Montr., McG.), Depts. of Psychiatry and Neurology and Neurosurgery

Assistant Professors

F. Jollant; M.D., M.Sc., Ph.D.(Montpellier), Dept. of Psychiatry
 D. Juncker; Dipl., Ph.D.(Neuchâtel), Dept. of Biomedical Engineering
 D. Klein; B.A., Ph.D.(Witw./S. Af.), Dept. of Neurology and Neurosurgery
 E. Kobayashi; M.D., Ph.D.(Campinas State), Dept. of Neurology and Neurosurgery
 L. Koski; B.Sc.(Tor.), Ph.D.(McG.), Dept. of Neurology and Neurosurgery
 N. Ladbou-Bernasconi; M.D.(Lausanne), Ph.D.(McG.), Dept. of Neurology and Neurosurgery
 A. Lamontagne; Ph.D.(Laval), School of Physical and Occupational Therapy
 G. Leonard; Ph.D.(McG.), Dept. of Neurology and Neurosurgery
 W. Ma; M.D.(Tongji), M.Sc., Ph.D.(McG.), Dept. of Psychiatry
 N. Mechawar, Ph.D.(Montr.), Dept. of Psychiatry
 C. Pack; B.Sc.(Tufts), Ph.D.(Boston), Dept. of Neurology and Neurosurgery
 K. Petrecca; B.Sc., M.D., Ph.D.(McG.), Dept. of Neurology and Neurosurgery
 J. Pruessner; Ph.D.(Trier), Dept. of Psychiatry
 E. Ruthazer; A.B.(Princ.), Ph.D.(Calif.-San Francisco), Dept. of Neurology and Neurosurgery
 J.T. Sakata; B.A.(C'nell), Ph.D.(Texas-Austin), Dept. of Biology
 P. Schweinhardt; M.D.(Heidelberg), Ph.D.(Oxf.), Depts. of Dentistry, Neurology and Neurosurgery
 A. Shmuel; B.Med., M.Sc.(Hebrew), Ph.D.(Weizmann Institute of Science), Dept. of Neurology and Neurosurgery
 P.J. Sjoström; M.Sc.(Uppsala), Ph.D.(Brandeis), Dept. of Neurology and Neurosurgery
 K. Steinhauer; M.Sc., Ph.D.(Dr.rer.nat)(Free Univ., Berlin), School of Communication Sciences and Disorders
 D. Stellwagen; B.Sc.(Brown), Ph.D.(Calif.), Dept. of Neurology and Neurosurgery
 L. Stone; Ph.D.(Minn.), Dept. of Dentistry
 K.-F. Storch; Ph.D.(Max Planck), Dept. of Psychiatry
 T. Stroh; Dip.(J. Liebig U.), Ph.D.(Max Planck), Dept. of Neurology and Neurosurgery
 V. Sziklas; Ph.D.(McG.), Dept. of Neurology and Neurosurgery
 T. Taivassalo; B.Sc., Ph.D.(McG.), Dept. of Kinesiology and Physical Education
 D. Van Meyel; Ph.D.(W. Ont.), Dept. of Neurology and Neurosurgery
 M. Vollrath; Ph.D.(Baylor), Dept. of Neurology and Neurosurgery
 A. Watt; Ph.D.(Brandeis), Dept. of Biology
 P. Wintermark; M.D.(McG.), Dept. of Pediatrics
 S.C. Woolley; B.Sc.(McG.), Ph.D.(Texas-Austin), Dept of Biology
 T.P. Wong; Ph.D.(McG.), Dept. of Psychiatry
 J. Zhang; M.D.(Shanghai II Medical U.), M.Sc.(Paris XI), Ph.D.(Laval), Dept. of Neurology and Neurosurgery

Lecturer

S. Antel

Adjunct Professors

L. Descarries
 G. Duncan
 M. Pfitz
 E. Racine

11.14.5 Master of Science (M.Sc.); Neuroscience (Thesis) (45 credits)**Thesis Courses**

Any remaining credits needed to complete the minimum of 45 may be chosen from the following:

NEUR 695	(3)	Master's Thesis Research 1
NEUR 696	(6)	Master's Thesis Research 2

Required Courses (33 credits)

NEUR 697	(9)	Master's Project Proposal
NEUR 698	(9)	Master's Seminar Presentation
NEUR 699	(12)	Master's Thesis Submission
NEUR 705	(0)	Responsible Research Conduct

and one of the following:

NEUR 610	(5)	Central Nervous System
NEUR 630	(3)	Principles of Neuroscience 1
NEUR 631	(3)	Principles of Neuroscience 2

Complementary Courses (6 credits)

6 credits in other graduate-level specialty courses relevant to the program.

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

Note: All M.Sc.-level students must register for a minimum of 12 credits per term during the first three terms of their master's program.

11.14.6 Doctor of Philosophy (Ph.D.); Neuroscience

Students with an M.Sc. degree continuing in this Department will receive credit exemptions for graduate coursework accomplished (including NEUR 630, and either NEUR 631 or NEUR 610). 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 equivalency. They will also be required to take 6 credits of graduate-level courses.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (3 credits)

Note: A student may receive an exemption if the student can display equivalency for NEUR 630.

NEUR 630	(3)	Principles of Neuroscience 1
NEUR 700	(0)	Doctoral Candidacy Examination
NEUR 705	(0)	Responsible Research Conduct

Complementary Courses (11 credits)

(9 - 11 credits)

Note: A student may receive exemptions if the student can display equivalencies for NEUR 631 and NEUR 610.

Students must take one of the following courses:

NEUR 610	(5)	Central Nervous System
NEUR 631	(3)	Principles of Neuroscience 2

Two courses at the 500, 600, or 700 level, approved by the graduate program adviser.

11.15 Occupational Health

11.15.1 Location

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

Website: www.mcgill.ca/occh

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

Telephone: 514-398-6258
Email: graduate.eboh@mcgill.ca

M.Sc.(A.) (Distance Education) program:

Telephone: 514-398-6989
Email: distance.occh@mcgill.ca
Website: www.mcgill.ca/occh/programs/distance

11.15.2 About Occupational Health

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. Special Student status may be granted to students who wish to take only specific courses from our M.Sc. program. There is a maximum of 12 credits overall, with a maximum of 6 credits per semester.

Students are required to have access to a computer and the Internet as some of the course material is most readily available by accessing the web.

section 11.15.5: Master of Science, Applied (M.Sc.A.); Occupational Health (Resident) (Non-Thesis) (45 credits)

A one-year program in health and hygiene appropriate for physicians, nurses, and graduates from engineering and basic sciences. Occupational health training allows candidates to evaluate work environments and attenuate work hazards using prevention and control.

section 11.15.6: Master of Science, Applied (M.Sc.A.); Occupational Health (Distance) (Non-Thesis) (45 credits)

A three-and-a-half-year program completed mostly over the Internet. This program is not accepting applicants for 2012–2013.

section 11.15.7: Doctor of Philosophy (Ph.D.); Occupational Health

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

11.15.3 Occupational Health Admission Requirements and Application Procedures

Revision, October 2012. Start of revision.

11.15.3.1 Admission Requirements

Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must 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 550, or 86 on the Internet-based test with each component score not less than 20.

M.Sc. Applied Program (Resident) (on campus)

Candidates should have completed, with a standing equivalent to a minimum cumulative grade point average (CGPA) of 3.0 out of 4.0, one of the requisites below:

- a bachelor of science degree or its equivalent, in a discipline relevant to occupational health or hygiene such as: chemistry, engineering, environmental sciences, physics
- an M.D. (medicine)
- a B.Sc. in health sciences or nursing

Distance Education

Candidates should have completed, with a standing equivalent to a minimum cumulative grade point average (CGPA) of 3.0 out of 4.0, one of the requisites below:

- an M.D. (medicine)
- a B.Sc. in health sciences or nursing
- a bachelor of science degree, or its equivalent, in a discipline relevant to occupational health or hygiene such as: chemistry, engineering, environmental sciences, physics

Candidates should have at least three years of experience in industrial hygiene and/or in safety.

For medical doctors and nurses, priority will be given to candidates with at least three years of experience in occupational health.

Ph.D. Program

Candidates must hold an 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.).

11.15.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See *section 6.3: Application Procedures (for All Admissions Starting Summer 2013)* for detailed application procedures.

Resident (on campus)

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

Applications are considered for Fall term only. We are not willing to consider any applications to be admitted for the Winter/Summer term.

Distance Education

Students are required to have access to a computer and the Internet as the course material is available through the web.

Ph.D. Program

Each student will be assigned to one academic staff member of the Department, who will act as his/her supervisor, and who will guide him/her in the preparation of a definite research protocol.

11.15.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

M.Sc. Applied (Resident)

- Curriculum Vitae
- Personal Statement
- Interview

M.Sc. Applied (Distance Education)

- Curriculum Vitae
- Personal Statement

Ph.D. Program

- Curriculum Vitae
- Personal Statement
- Research Proposal

11.15.3.3 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: Jan. 15	Fall: Jan. 15	Fall: Apr. 30
Winter: N/A	Winter: N/A	Winter: Sept. 15
Summer: N/A	Summer: N/A	Summer: N/A



Note: We are not willing to consider any applications to be admitted for the Winter/Summer term.

Revision, October 2012. End of revision.

11.15.4 Occupational Health Faculty**Chair**

R. Fuhrer

Emeritus Professors

M.R. Becklake; M.B.B.Ch., M.D.(Witw.), F.R.C.P.

A. Lippman; B.A.(C'nell), Ph.D.(McG.)

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

I.B. Pless; B.A., M.D.(W. Ont.)

S.H. Shapiro; B.S.(Bucknell), M.S., Ph.D.(Stan.)

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

S. Wood-Dauphinee; B.Sc.(Phys.Ther.), Dip.Ed., M.Sc.(A.), Ph.D.(McG.)

Professors Post-Retirement

A. Lippman; B.A.(C'nell), Ph.D.(McG.)

I.B. Pless; B.A., M.D.(W. Ont.)

S.H. Shapiro; B.S.(Bucknell), M.S., Ph.D.(Stan.)

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

S. Wood-Dauphinee; B.Sc.(Phys.Ther.), Dip.Ed., M.Sc.(A.), Ph.D.(McG.)

Professors

M. Abrahamowicz; Ph.D.(Cracow) (*James McGill Professor*)

J.F. Boivin; M.D.(Laval), S.M., Sc.D.(Harv.)

J. Brophy; B.Eng.(McG.), M.Eng., M.D.(McM.), Ph.D.(McG.) (*joint appt. with Medicine*)

E.L.F. Franco; M.P.H., Dr.P.H.(Chapel Hill) (*joint appt. with Oncology*) (*James McGill Professor*)

R. Fuhrer; B.A.(CUNY (Brooklyn College)), M.Sc., Ph.D.(Calif.-San Francisco)

T.W. Gyorkos; B.Sc.(McG.), M.Sc.(Bishop's), Ph.D.(McG.)

J.A. Hanley; B.Sc., M.Sc.(NUI), Ph.D.(Wat.) (*on leave Winter 2012 and Winter 2013*)

J. Heymann; B.A.(Yale), M.P.H., M.D., Ph.D.(Harv.) (*joint appt. with Political Science*) (*Canada Research Chair*)

C. Infante-Rivard; M.D.(Montr.), M.P.H.(Calif.-LA), Ph.D.(McG.), F.R.C.P.(C) (*James McGill Professor*)

L. Joseph; M.Sc., Ph.D.(McG.)

M.S. Kramer; B.A.(Chic.), M.D.(Yale) (*joint appt. with Pediatrics*) (*James McGill Professor*) (*on leave Jan. 2012 to June 2013*)

J. McCusker; M.D.,C.M.(McG.), M.P.H., Ph.D.(Col.)

R. Menzies; M.D.,C.M., M.Sc.(McG.) (*joint appt. with Medicine*)

Professors

O.S. Miettinen; M.D.(Helsinki), M.P.H., M.S., Ph.D.(Minn.)
 G. Paradis; M.D.(Montr.), M.Sc.(McG.)
 R.W. Platt; M.Sc.(Man.), Ph.D.(Wash.) (*joint appt. with Pediatrics*)
 S. Suissa; M.Sc.(McG.), Ph.D.(Flor.) (*joint appt. with Medicine*) (*James McGill Professor*)
 R. Tamblyn; M.Sc.(McM.), Ph.D.(McG.) (*joint appt. with Medicine*) (*James McGill Professor*)
 C. Wolfson; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Medicine*)

Associate Professors

O. Basso; Ph.D.(Milan) (*joint appt. with Obstetrics & Gynecology*)
 D. Buckeridge; M.D.(Qu.), M.Sc.(Tor.), Ph.D.(Stan.) (*Canada Research Chair*)
 A. Ciampi; M.Sc., Ph.D.(Qu.), Ph.D.(Rome)
 N. Dendukuri; M.Sc.(Indian I.T.), Ph.D.(McG.) (PT) (*joint appt. with Medicine*)
 C. Greenwood; B.Sc.(McG.), M.Sc.(Wat.), Ph.D.(Tor.) (*joint appt. with Oncology*)
 P. Héroux; B.Sc.(Laval), M.Sc., Ph.D.(I.N.R.S.)
 J. Kaufman; B.A.(Johns Hop.), Ph.D.(Mich.)
 A. Manges; B.A.(Col.), M.P.H., Ph.D.(Calif., Berk.)
 M. Pai; M.B.B.S.(Stanley Medical College), M.D.(Christian Medical College), Ph.D.(Calif., Berk.)
 J. Pickering; B.A.(Tor.), M.D., M.Sc.(McG.) (*joint appt. with Medicine*)
 A. Quesnel-Vallee; B.A., M.Sc.(Montr.), M.A., Ph.D.(Duke) (*joint appt. with Sociology*)
 M. Rossignol; B.Sc., M.D.(Sher.), M.Sc.(McG.), F.R.C.P.(C)
 P. Tousignant; B.A., M.D.(Laval), M.Sc.(McG.), F.R.C.P.(C) (PT)

Assistant Professors

A. Adrien; M.D., M.Sc.(McG.)
 A. Benedetti; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Medicine*)
 J. Cox; B.Sc., B.A., M.D.(Dal.), M.Sc.(McG.), C.C.F.P., F.R.C.P.(C) (*joint appt. with Family Medicine*)
 S. Harper; B.A.(Westminister), M.S.P.H.(S. Carolina), Ph.D.(Mich.)
 A. Labbe; M.Sc.(Montr.), Ph.D.(Wat.) (*joint appt. with Psychiatry*)
 S. Martin; M.D.(Tor.), M.Sc.(McG.) (PT)
 E.E.M. Moodie; B.A.(Winn.), Ph.D.(Wash.)
 A. Nandi; B.S.(College of New Jersey), M.P.H.(Col.), Ph.D.(Johns Hop.) (*joint appt. with Institute for Health & Social Policy*)
 L. Patry; B.Sc., M.D.(Laval), F.R.C.P.(C) (PT)
 E. Strumpf; B.A.(Smith), Ph.D.(Harv.) (*joint appt. with Economics*)
 G. Tan; D.Phil.(Oxf.) (PT)

Associate Members

Biomedical Ethics Unit: N. King

Dietetics and Human Nutrition: K. Gray-Donald

Dentistry: P. Allison, J. Feine

Family Medicine: A. Andermann, J. Haggerty, T. Tannenbaum

Geography: N. Ross

Medicine: A. Barkun, M. Behr, S. Bernatsky, T. Brewer, J. Bourbeau, P. Brassard, A. Clarke, K. Dasgupta, M. Eisenberg, P. Ernst, M. Goldberg, C. Greenaway, S. Kahn, M. Klein, N. Mayo, N. Pant Pai, L. Pilote, E. Rahme, B. Richards, K. Schwartzman, M. Sewitch, I. Shrier, V. Tagalakis

Associate Members*Ob/Gyn:* H. Abenhaim, R. Gagnon*Pathology:* B. Case*Pediatrics:* G. Dougherty, B. Foster, C. Quach-Thanh*Physical & Occupational Therapy:* S. Ahmed*Psychiatry:* E. Latimer, A. Malla, N. Schmitz, B. Thombs**Lecturers**

J.P. Gauvin, W. Wood

Adjunct Professors*Asociación Civil Selva Amazónica Peru:* M. Casapia*Caro Research:* J. Caro*Direction régionale de la santé publique:* R. Allard, M. Baillargeon, R. Lessard, S. Palmieri, S. Perron, E. Robinson*Harvard Univ.:* J. Brownstein*Hôpital Sacré-Cœur:* D. Gautrin*Independent:* I. Arnold, M.A. Lavoie, J. Lemke, M. Schweigert, L. Scott*INSPQ:* F. Richer, P. Robillard, S. Stock*Montreal Chest Hospital Centre:* P. Rohan*Mount Sinai:* M. Baltzan*Stabilis:* P. Simon*Univ. de Montréal:* R. Massé, J. Siemiatycki*Univ. of S. Australia:* J. Lynch**11.15.5 Master of Science, Applied (M.Sc.A.); Occupational Health (Resident) (Non-Thesis) (45 credits)****Research Project (15 credits)**

OCCH 699	(15)	Project Occupational Health and Safety
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Required Courses (30 credits)

Note: Students must pass the Master's Integrative Examination (OCCH 600) before writing their Project.

OCCH 600	(0)	Master's Integrative Exam
OCCH 602	(3)	Occupational Health Practice
OCCH 603	(3)	Work and Environment Epidemiology 1
OCCH 604	(3)	Monitoring Occupational Environment
OCCH 605	(6)	Physical Health Hazards
OCCH 608	(3)	Biological 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

11.15.6 Master of Science, Applied (M.Sc.A.); Occupational Health (Distance) (Non-Thesis) (45 credits)

This program is not accepting applicants for 2012-2013.

Research Project (15 credits)

OCCH 699	(15)	Project Occupational Health and Safety
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Required Courses (30 credits)

Note: Students must pass the Master's Integrative Examination (OCCH 600) before writing their Project.

Each course has a final (proctored) examination at the end of the term.

OCCH 600	(0)	Master's Integrative Exam
OCCH 602	(3)	Occupational Health Practice
OCCH 603	(3)	Work and Environment Epidemiology 1
OCCH 604	(3)	Monitoring Occupational Environment
OCCH 608	(3)	Biological 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 and Behavioural Aspects - Occupational Health
OCCH 625	(3)	Work and Environment Epidemiology 2
OCCH 626	(3)	Basics: Physical Health Hazards
OCCH 627	(3)	Work Physiology and Ergonomics
OCCH 630	(3)	Occupational Diseases for OHNS
OCCH 635	(3)	Environmental Risks to Health

On-campus practicum 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. Participation in the practicum is an essential component of the program.

11.15.7 Doctor of Philosophy (Ph.D.); Occupational Health**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (2 credits)

OCCH 700	(0)	Ph.D. Comprehensive Examination
OCCH 706	(2)	Ph.D. Seminar on Occupational Health and Hygiene

Students 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.

11.16 Otolaryngology – Head and Neck Surgery

11.16.1 Location

Department of Otolaryngology – Head and Neck Surgery
 Jewish General Hospital
 3755 Chemin de la Côte-Sainte-Catherine, Suite E-903
 Montreal, QC H3T 1E2
 Canada

Telephone: 514-340-8222 ext. 3179
 Fax: 514-340-7934
 Website: www.mcgill.ca/ent

11.16.2 About Otolaryngology – Head and Neck Surgery

The Master of Science degree in Otolaryngology trains otolaryngologists and physicians for clinical or basic science research in Otolaryngology – Head and Neck Surgery. Master's programs can include research on normal function and disease of head and neck structures: otology, neuro-otology, laryngology, rhinology, oncology, surgery, auditory-vestibular sciences, middle-ear modelling, oto-toxicity, genomics, infection, thyroid disease, or genetics.

section 11.16.5: Master of Science (M.Sc.); Otolaryngology (Thesis) (45 credits)

The Master's program is intended for otolaryngologists or for physicians with a strong interest in otolaryngology research. Under exceptional circumstances, others (Ph.D.s, dentists, veterinarians, medical professionals, etc.) may be considered. The program addresses research questions using an interdisciplinary approach, combining methodologies of both the clinical sciences and the basic sciences. The Master's program is unique in Canada and rare elsewhere. Medical professionals graduating from the program can better treat ear-nose-throat diseases; they are better positioned to do, and to evaluate, research in Otolaryngology. They typically obtain the most highly sought positions in their fields.

11.16.3 Otolaryngology Admission Requirements and Application Procedures

Revision, October 2012. Start of revision.

11.16.3.1 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.

Applicants should be otolaryngologists, or they should be currently enrolled in a residency program leading to certification in Otolaryngology, or they should be physicians with a strong interest in Otolaryngology Research. Under exceptional circumstances, others (Ph.D.s, dentists, veterinarians, medical professionals, etc.) will be considered.

The results of the Test of English as a Foreign Language (TOEFL) (minimum of 550 on the paper-based test or 86 on the Internet-based test with each component score not less than 20) is required for applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone).

11.16.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See *section 6.3: Application Procedures (for All Admissions Starting Summer 2013)* for detailed application procedures.

Prospective students should contact research supervisors individually.

11.16.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Personal Statement
- Acceptance by a research supervisor

11.16.3.3 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: March 15	Fall: March 15	Fall: March 15

Canadian	International	Special/Exchange/Visiting
Winter: Sept. 15	Winter: Sept. 15	Winter: Sept. 15
Summer: Jan. 15	Summer: Jan. 15	Summer: Jan. 15

Revision, October 2012. End of revision.

11.16.4 Otolaryngology – Head and Neck Surgery Faculty

Chair

S. Frenkiel

Graduate Program Director and Director of Research

B. Segal

Director of Residency Training Program

J. Manoukian

Director of Head and Neck Oncology Program

M.J. Black

Director of Undergraduate Education

L. Nguyen

Director of Fellowship Training

J. Rappaport

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.)(McG.), 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)

S. Daniel; M.D.,C.M., M.Sc.(Otol.)(McG.), F.R.C.S.(C)

M. Desrosiers; M.D.(Montr.), F.R.C.S.C.

N. Fanous; M.B., B.CH.(Cairo), 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)

J. Manoukian; M.B., Ch.B.(Alex.), F.R.C.S.(C)

W.H. Novick; M.D.(Qu.), F.R.C.S.(C)

J. Rappaport; M.D.(Dal.), 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)

Associate Professors

A.G. Zeitouni; M.D.(Sher.), M.Sc.(Otol.)(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)

Y. Lacroix; M.D.(Laval), F.R.C.S.(C)

R. Lafleur; M.D.(Ott.), F.R.C.S.(C)

A. Mlynarek; M.D.,C.M., M.Sc.(Otol.)(McG.), F.R.C.S.(C)

L. Nguyen; M.D.,C.M.(McG.), F.R.C.S.(C)

R. Payne; M.D.,C.M., M.Sc.(Otol.)(McG.), F.R.C.S.(C)

M. Samaha; M.D.(Qu.), M.Sc.(Otol.)(McG.), 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)

M. Tewfik; M.D.,C.M., M.Sc.(Otol.)(McG.), F.R.C.S.(C)

Associate Members

K. E. Cullen; Ph.D.(McG.)

W.R.J. Funnell; B.Eng., M.Eng., Ph.D.(McG.)

H.L. Galiana; B.Eng., M.Eng., Ph.D.(McG.)

Q. Hamid; M.D.(Iraq), Ph.D.Med.(Lond.)

L. Mongeau; B.Sc., M.Sc.(Montr.), Ph.D.(Penn. St.)

Lecturers

R. Caouette, A. Finesilver, J. Rothstein, T.T. Vi Vu, J. Young

Adjunct Professor

Véronique Isabelle Forest; M.D., M.Sc.(Exp. Med.)(Laval), F.R.C.S.(C)

11.16.5 Master of Science (M.Sc.); Otolaryngology (Thesis) (45 credits)**Thesis Courses (30 credits)**

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

Required Courses (12 credits)

When appropriate, courses OTOL 602, OTOL 612, OTOL 603, or OTOL 613 may be replaced by other Basic Science or Clinical (500, 600, or 700 level) courses of relevance to Otolaryngology, as recommended or approved by the Department.

OTOL 602	(3)	Physiology, Histopathology and Clinical Otolaryngology 1
OTOL 603	(3)	Advanced Scientific Principles - Otolaryngology 1

OTOL 612	(3)	Physiology, Histopathology and Clinical Otolaryngology 2
OTOL 613	(3)	Advanced Scientific Principles - Otolaryngology 2

Complementary Course

Revision, August 2012. Start of revision.

(3-4 credits)

EPIB 507	(3)	Biostatistics for Health Professionals
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or equivalent.

Revision, August 2012. End of revision.

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

11.17 Pathology

11.17.1 Location

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: pathologyteaching.med@mcgill.ca

Website: www.mcgill.ca/pathology

11.17.2 About Pathology

Pathology is the science of disease, and research in pathology is focused on understanding the cellular and molecular changes that cause disease, generating knowledge that is essential in the development of new methods for prevention and treatment. Pathology is a multidisciplinary science, and laboratory techniques overlap those used in all current fields of biomedical investigation. We offer unique opportunities for graduate students to conduct fundamental biomedical research that is directly linked to patient care, working with teams of highly experienced investigators and clinicians. Our laboratories are located on the main campus and throughout the McGill network of hospitals and research institutes. Our investigators collaborate with basic scientists from a variety of other departments, and undertake collaborative studies with colleagues in academic institutions around the world. Graduate students take part in joint clinical-experimental presentations involving our 48 faculty members, gaining broad exposure to current issues in diagnosis and treatment of disease. This opportunity to combine basic research and potential applications offers very exciting possibilities for a highly rewarding career.

The Pathology Department offers research training in a wide variety of areas such as immunology and transplantation, neoplasia, ophthalmic pathology, 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), laser capture, DNA analysis, cell culture, advanced immunological, pharmacological, biochemical, and physiological techniques, as well as morphometry and computer-aided analysis.

section 11.17.5: Master of Science (M.Sc.); Pathology (Thesis) (45 credits)

Graduates can directly enter rewarding careers in research, or opt to continue with their studies and obtain a Ph.D. Some combine their research training with subsequent training in medicine, law, or business administration.

section 11.17.6: Doctor of Philosophy (Ph.D.); Pathology

Our graduates enter successful careers in industry, academia, government/international agencies, or clinical medicine, sometimes combining two of these options. They leave McGill with experience in leadership and communication skills in addition to being highly trained in biomedical research, and their career choices include a wide range of administrative and research positions around the world.

11.17.3 Pathology Admission Requirements and Application Procedures

Revision, October 2012. Start of revision.

11.17.3.1 Admission Requirements

Applicants must have a B.Sc. or an 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 4.0 at McGill is required for at least the two final full-time years of undergraduate training, with a minimum CGPA of 3.0 overall.

Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit the GRE and TOEFL examinations in order to be properly evaluated as to 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.

For further information, applicants may contact the Teaching Office, Department of Pathology.

11.17.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

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.

11.17.3.3 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: June 30	Fall: Apr. 30	Fall: Same as Canadian/International
Winter: Nov. 15	Winter: Sept. 30	Winter: Same as Canadian/International
Summer: March 15	Summer: Feb. 28	Summer: Same as Canadian/International

Revision, October 2012. End of revision.

11.17.4 Pathology Faculty

Chair

D. Haegert

Director of Graduate Program

E. Zorychta

Professors

M.N. Burnier Jr.; M.D., M.Sc., Ph.D.(Brazil)

A.M.V. Duncan; B.Sc.(Qu.), 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)

D. Haegert; M.D.(Br. Col.), F.R.C.P.(C)

Q.A. Hamid; M.D.(Mosul), Ph.D.(Lond.) (*James McGill Professor*) (*joint appt. with Medicine*)

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

J.B. Richardson; B.Sc., M.D.,C.M., Ph.D.(McG.), F.R.C.P.(C)

A. Spatz; M.Sc., M.D.(Paris)

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)
 C. Bernard; M.D.(Sher.), 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)
 T. Haliotis; M.D.(Greece), Ph.D.(Qu.), F.R.C.P.(C)
 E. Lamoureux; B.Sc., M.D.(Montr.), 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)
 I. Roy; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)
 A.K. Watters; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)
 E. Zorychta; B.Sc.(St. FX), M.Sc., Ph.D.(McG.)

Assistant Professors

S. Albrecht; M.D.(Sher.), F.R.C.P.(C)
 O. Aleynikova; M.D.(Dal.), F.R.C.P.(C)
 R.D. Amre; M.B.B.S.(India), F.R.C.P.(C)
 K. Bakdounes; M.D.(Damascus), F.R.C.P.(C)
 M. Blumenkrantz; M.D.,C.M.(McG.), F.R.C.P.(C)
 G.A. Brandao; M.D.(Brazil)
 F. Brimo; M.D.(Damascus), F.R.C.P.(C)
 D. Caglar; M.D.(Turkey)
 P.J. Chauvin; M.Sc.(W. Ont.), D.D.S.(McG.)
 B.F. Fernandes; M.D., Ph.D.(Brazil)
 A. Florea; M.D.(Romania)
 L. Fu; M.D.,C.M.(McG.), M.Sc.(McG.), F.R.C.P.(C)
 A. Gologan; M.D.(Romania)
 M.-C. Guiot; B.Sc., M.D.(Bordeaux)
 S.-M. Jung; M.D.(Korea)
 Y. Kanber; M.D.(Turkey)
 J. Lavoie; B.Sc., M.Sc., Ph.D.(Laval)
 H.R. Lopez-Valle; M.D.(Mexico)
 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)
 A. Nahal; M.D.(Aleppo)
 V.-H. Nguyen; M.D.(Montr.), F.R.C.P.(C)
 A. Omeroglu; M.D.(Istanbul)
 G. Omeroglu-Altinel; M.D.(Istanbul)
 M. Pelmus; M.D.(Romania), Ph.D.(Romania)
 D. Pilavdzic; M.D.(Zagreb), F.R.C.P.(C)

Assistant Professors

S. Sandhu; M.B., B.S.(India)

H. Srolovitz; B.Sc.(Pitt.), M.D.(Basel)

J. St. Cyr; M.D.,C.M.(McG.), F.R.C.P.(C)

11.17.5 Master of Science (M.Sc.); Pathology (Thesis) (45 credits)

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 that are relevant to the student's area of research will be chosen in consultation with the research director and Graduate Students Committee.

Thesis Courses (30 credits)

PATH 690	(9)	M.Sc. Thesis Research Project 1
PATH 691	(9)	M.Sc. Thesis Research Project 2
PATH 692	(12)	M.Sc. Thesis Research Project 3

Required Courses (6 credits)

PATH 620	(3)	Research Seminar 1
PATH 622	(3)	Research Seminar 2

Complementary Courses (9 credits)

3 credits, one of the following courses:

PATH 613	(3)	Research Topics in Pathology 1
PATH 614	(3)	Research Topics in Pathology 2

6 credits, two 500-, 600-, or 700-level courses offered by the Department; subject to approval of the research director and Graduate Students Committee, up to 3 credits of 500-, 600-, or 700-level credits may be taken in another department.

11.17.6 Doctor of Philosophy (Ph.D.); Pathology**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (12 credits)

PATH 613	(3)	Research Topics in Pathology 1
PATH 614	(3)	Research Topics in Pathology 2
PATH 620	(3)	Research Seminar 1
PATH 622	(3)	Research Seminar 2
PATH 701	(0)	Comprehensive Examination - Ph.D. Candidates

Complementary Courses (9 credits)

Three 500-, 600-, or 700-level courses offered by the Department; subject to the approval of the research director and Graduate Students Committee, up to one 500-, 600-, or 700-level course may be taken in another department.

11.18 Pharmacology and Therapeutics

11.18.1 Location

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: 514-398-2045

Email: gradstudies.pharmacology@mcgill.ca

Website: www.medicine.mcgill.ca/pharma

11.18.2 About Pharmacology and Therapeutics

The Department of Pharmacology and Therapeutics offers training leading to M.Sc. (Thesis) and Ph.D. degrees.

The Department also offers the Chemical Biology Interdisciplinary Graduate Option, together with the Departments of Biochemistry and Chemistry. Students interested in training in this option must first be accepted for graduate studies by one of the participating departments. Information on this option can be found at: www.mcgill.ca/biochemistry/chemicalbiology.

Pharmacology is a multidisciplinary science that 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 a range of areas of specialty, including neuropharmacology, reproductive, endocrine, receptor, cardiovascular, cancer, developmental, autonomic, clinical, and biochemical pharmacology, molecular biology, and toxicology.

The present 52 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 Centre, 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.

section 11.18.5: Master of Science (M.Sc.); Pharmacology (Thesis) (45 credits)

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.

section 11.18.6: Master of Science (M.Sc.); Pharmacology (Thesis) — Chemical Biology (47 credits)

The Chemical Biology Thematic Group is engaged in a diverse range of research topics that span structural biology, enzymology, nucleic acid research, signalling pathways, single molecule biophysics, and biophysical chemistry of living tissues. Among the themes that unite the research being performed in this group is trying to learn new chemistry and physics from biological systems.

We have projects relating to pharmaceutically relevant enzymes such as those involved in drug metabolism and antibiotic resistance; development of therapeutic agents in the control of inflammation, cancer, and viral infections; the chemical biology of NO; quantification of bioenergetic markers of metabolism; self-assembly mechanisms of the HIV-1 virion capsid; liposome microarray systems to address membrane protein dynamics and recognition; studies on reactive oxygen species translocation across the aqueous/lipid membrane interface; RNAi/antisense technologies; dynamic combinatorial chemistry; protein dynamics and function; mechanistic aspects involved in cellular adhesion and transport in membrane and zeolite channels; and cutting-edge microscopes used to examine transport, motility, and reactivity in cells.

section 11.18.7: Doctor of Philosophy (Ph.D.); Pharmacology

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.

section 11.18.8: Doctor of Philosophy (Ph.D.); Pharmacology — Chemical Biology

The Chemical Biology Thematic Group is engaged in a diverse range of research topics that span structural biology, enzymology, nucleic acid research, signalling pathways, single molecule biophysics, and biophysical chemistry of living tissues. Among the themes which unite the research being performed in this group is the attempt to learn new chemistry and physics from biological systems.

We have projects relating to pharmaceutically relevant enzymes such as those involved in drug metabolism and antibiotic resistance; development of therapeutic agents in the control of inflammation, cancer and viral infections; the chemical biology of NO; quantification of bioenergetic markers of

section 11.18.8: Doctor of Philosophy (Ph.D.); Pharmacology — Chemical Biology

metabolism; self-assembly mechanisms of the HIV-1 virion capsid; liposome microarray systems to address membrane protein dynamics and recognition; studies on reactive oxygen species translocation across the aqueous/lipid membrane interface; RNAi/antisense technologies; dynamic combinatorial chemistry; protein dynamics and function; mechanistic aspects involved in cellular adhesion and transport in membrane and zeolite channels; and cutting-edge microscopes used to examine transport, motility, and reactivity in cells.

11.18.3 Pharmacology and Therapeutics Admission Requirements and Application Procedures

Revision, October 2012. Start of revision.

11.18.3.1 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. Students are required to take the Graduate Record Examination Aptitude Test (GRE) and the Test of English as a Foreign Language (TOEFL) or the equivalent, except as follows, in accordance with McGill policy, only those whose mother tongue is English, who graduated from a recognized Canadian institution (anglophone or francophone), or who completed an undergraduate or graduate degree at a recognized foreign institution where English is the language of instruction are exempt from providing proof of competency in English.

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.

Admissions Requirements – Chemical Biology Option

As for the regular graduate programs of the participating departments, acceptance into the Chemical Biology option consists of two steps:

1. Preliminary approval by the Department's Graduate Committee based on the student's transcript, references, and other documents submitted with the application. The criteria for assessment at this level are the same as those for the regular graduate programs of the participating departments.
2. Acceptance by an individual research director. For students wishing to participate in the Chemical Biology option, the director must propose a research project for the student that provides training in the methods and philosophy of chemical biology. Project proposals are assessed by the Chemical Biology Program Committee.

11.18.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

11.18.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Curriculum Vitae
- Research Proposal
- GRE
- Acceptance by a Chemical Biology research director (Chemical Biology option only)

11.18.3.3 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: March 15	Fall: March 15	Fall: March 15
Winter: Oct. 15	Winter: Sept. 15	Winter: Same as Canadian/International
Summer: N/A	Summer: N/A	Summer: N/A

Please refer to our website (www.medicine.mcgill.ca/pharma) for complete deadlines.

Revision, October 2012. End of revision.

11.18.4 Pharmacology and Therapeutics Faculty**Chair**

G. Multhaup

Graduate Program Director

D. Bowie

Emeritus Professor

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

Professors

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

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

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

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

D. Maysinger; Ph.D.(USC)

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

G. Multhaup; Ph.D.(Univ. of Cologne)

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

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

H. Saragovi; Ph.D.(Miami)

M. Szyf; Ph.D.(Hebrew)

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

H.H. Zingg; M.D., Ph.D.(McG.)

Associate Professors

D. Bernard; Ph.D.(Johns Hop.)

D. Bowie; B.Sc., Ph.D.(Lond.)

T. Hébert; Ph.D.(Tor.)

A. McKinney; Ph.D.(Ulster)

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

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

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

Assistant Professor

J. Tanny; Ph.D.(Harv.)

Associate Members

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

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

M. Culty; Ph.D.(Fr.)

G. Di Battista; B.Sc., Ph.D.(Montr.)

L. Fellows; M.D., C.M.(McG.) Ph.D.(Oxf.)

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

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

T. Geary; Ph.D.(Mich.)

B. Jean-Claude; Ph.D.(McG.)

S. Kimmins; Ph.D.(Dal.)

Associate Members

S. Laporte; Ph.D.(Sher.)
 C. O'Flaherty; Ph.D.(Buenos Aires)
 V. Pappadopoulos; Ph.D.(Univ. Pierre & Marie Curie)
 R. Prichard; Ph.D.(NSW)
 R. Quirion; Ph.D.(Sher.)
 S. Rousseau; Ph.D.(Laval)
 Y. Shir; M.D.(Israel), Ph.D.(Johns Hop.)
 L. Stone; Ph.D.(Minn.)
 M. Ware; MBBS(West Indies)
 T. P. Wong; Ph.D.(McG.)

Adjunct Professors

B. Allen, M. Bruno, S. Chemtob, Y. De Koninck, L. Garofalo, J.M.A. Laird, J. Mancini, K. Meerovitch, T. Sanderson

11.18.5 Master of Science (M.Sc.); Pharmacology (Thesis) (45 credits)**Thesis Courses (24 credits)**

PHAR 696	(3)	Thesis Preparation
PHAR 698	(9)	Thesis Preparation 2
PHAR 699	(12)	Thesis Preparation 3

Required Courses (9 credits)

PHAR 601	(6)	Comprehensive
PHAR 712	(3)	Statistics for Pharmacologists

Complementary Courses (12 credits)

6 credits, from the following courses:

PHAR 562	(3)	General Pharmacology 1
PHAR 563	(3)	General Pharmacology 2

or, for students who have taken PHAR 562 and PHAR 563 as part of their undergraduate degree, they will register for the following course:

PHAR 697	(6)	Thesis Preparation 1
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6 credits, two 700-level PHAR courses.

11.18.6 Master of Science (M.Sc.); Pharmacology (Thesis) — Chemical Biology (47 credits)**Thesis Courses (24 credits)**

PHAR 696	(3)	Thesis Preparation
PHAR 698	(9)	Thesis Preparation 2
PHAR 699	(12)	Thesis Preparation 3

Required Courses (9 credits)

PHAR 601	(6)	Comprehensive
PHAR 712	(3)	Statistics for Pharmacologists

Complementary Courses (14 credits)

2 credits, two of the following courses:

BIOC 610	(1)	Seminars in Chemical Biology 1
BIOC 611	(1)	Seminars in Chemical Biology 3
BIOC 689	(1)	Seminars in Chemical Biology 2
BIOC 690	(1)	Seminars in Chemical Biology 4

6 credits, from the following courses:

PHAR 562	(3)	General Pharmacology 1
PHAR 563	(3)	General Pharmacology 2

or, for students who have taken PHAR 562 and PHAR 563 as part of their undergraduate degree, they can be replaced with two of the following courses:

BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
CHEM 504	(3)	Drug Design and Development 2
CHEM 522	(3)	Stereochemistry
CHEM 591	(3)	Bioinorganic Chemistry
CHEM 621	(5)	Reaction Mechanisms in Organic Chemistry
CHEM 629	(5)	Organic Synthesis
CHEM 655	(4)	Advanced NMR Spectroscopy
PHAR 504	(3)	Drug Discovery and Development 2
PHAR 707	(3)	Topics in Pharmacology 6

3 credits, one of the following courses:

PHAR 700	(3)	Seminars in Pharmacology
PHAR 702	(3)	Topics in Pharmacology 1
PHAR 703	(3)	Topics in Pharmacology 2
PHAR 704	(3)	Topics in Pharmacology 3
PHAR 705	(3)	Topics in Pharmacology 4
PHAR 706	(3)	Topics in Pharmacology 5
PHAR 707	(3)	Topics in Pharmacology 6

3 credits, one of the following courses:

CHEM 502	(3)	Advanced Bio-Organic Chemistry
PHAR 503	(3)	Drug Discovery and Development 1

11.18.7 Doctor of Philosophy (Ph.D.); Pharmacology**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Students must successfully complete, or be exempted from, the same courses as for the equivalent M.Sc. in Pharmacology, plus one additional 700-level graduate course (for a total of three).

11.18.8 Doctor of Philosophy (Ph.D.); Pharmacology — Chemical Biology**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (13 credits)

BIOC 610	(1)	Seminars in Chemical Biology 1
BIOC 611	(1)	Seminars in Chemical Biology 3
BIOC 689	(1)	Seminars in Chemical Biology 2
BIOC 690	(1)	Seminars in Chemical Biology 4
PHAR 601	(6)	Comprehensive
PHAR 712	(3)	Statistics for Pharmacologists

Complementary Courses (14 credits)

6 credits, from the following courses:

PHAR 562	(3)	General Pharmacology 1
PHAR 563	(3)	General Pharmacology 2

or, for students who have taken PHAR 562 and PHAR 563 as part of their undergraduate degree, they can replace them with two of the following courses:

BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
CHEM 504	(3)	Drug Design and Development 2
CHEM 522	(3)	Stereochemistry
CHEM 591	(3)	Bioinorganic Chemistry
CHEM 621	(5)	Reaction Mechanisms in Organic Chemistry
CHEM 629	(5)	Organic Synthesis
CHEM 655	(4)	Advanced NMR Spectroscopy
PHAR 504	(3)	Drug Discovery and Development 2
PHAR 707	(3)	Topics in Pharmacology 6

two of the following courses:

PHAR 700	(3)	Seminars in Pharmacology
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PHAR 702	(3)	Topics in Pharmacology 1
PHAR 703	(3)	Topics in Pharmacology 2
PHAR 704	(3)	Topics in Pharmacology 3
PHAR 705	(3)	Topics in Pharmacology 4
PHAR 706	(3)	Topics in Pharmacology 5
PHAR 707	(3)	Topics in Pharmacology 6

one of the following courses:

CHEM 502	(3)	Advanced Bio-Organic Chemistry
PHAR 503	(3)	Drug Discovery and Development 1

11.19 Physiology

11.19.1 Location

Department of Physiology
McIntyre Medical Sciences Building
3655 Promenade Sir-William-Osler
Montreal, QC H3G 1Y6
Canada

Telephone: 514-398-4343

Fax: 514-398-7452

Website: www.medicine.mcgill.ca/physio

11.19.2 About Physiology

The Physiology Department offers training leading to M.Sc. and Ph.D. degrees. The scope of the ongoing research, and close connections with the McGill teaching hospitals, offer excellent opportunities for collaborations with hospital-based scientists. Research in the Department covers a broad range of topics from systems neuroscience to molecular and cellular biology. Interests include studies of nuclear and membrane receptors, transporters, channels, and signal transduction pathways, to the broader integration of physiological systems (cardiovascular, respiratory, renal, endocrine, immune, and central nervous systems) using an array of molecular and cellular approaches as well as quantitative techniques in data collection, analysis, and mathematical modelling by computational means. All graduate students in Physiology receive financial support. Any faculty member who agrees to supervise a student who does not hold a fellowship is obliged to provide financial support.

section 11.19.5: Master of Science (M.Sc.); Physiology (Thesis) (49 credits)

The M.Sc. program is intended for students from an academic background wishing to pursue careers in academia, industry, or in medicine. The multidisciplinary nature of the Department exposes students to a vast array of research interests and experimental approaches. Thesis work is available in a broad range of disciplines from molecular and cellular to systems physiology covering multiple organ systems. Students wishing to continue to the doctoral program have the option of transferring to the Ph.D., and waiving the M.Sc. thesis submission.

section 11.19.6: Master of Science (M.Sc.); Physiology (Thesis) — Bioinformatics (49 credits)

The intention of the Bioinformatics Option is to train M.Sc. students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyze datasets, the application of modelling techniques, the creation of tools for manipulating of bioinformatics data, the integration of biological databases, and the use of algorithms and statistics. Students successfully completing the Bioinformatics Option will be fluent in the concepts, language, approaches, and limitations of the field. The option consists of a number of interdisciplinary courses and a seminar designed to bring students from many backgrounds together and to provide a thorough overview of research in this field.

section 11.19.7: Doctor of Philosophy (Ph.D.); Physiology

The doctoral program is intended for students from a strong academic background wishing to pursue research-intensive careers in academia, industry, or in medicine. The multidisciplinary nature of the Department exposes students to a vast array of research interests and experimental approaches. Thesis work provides in-depth training in a broad range of disciplines from molecular and cellular to systems physiology covering multiple organ systems.

section 11.19.8: Doctor of Philosophy (Ph.D.); Physiology — Bioinformatics

The intention of the Bioinformatics Option is to train Ph.D. students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyze datasets, the application of modelling techniques, the creation of tools for manipulating of bioinformatics data, the integration of biological databases, and the use of algorithms and statistics. Students successfully completing the Bioinformatics Option will be fluent in concepts, language, approaches, and limitations of the field. The option consists of a number of interdisciplinary courses and a seminar designed to bring students from many backgrounds together and to provide a thorough overview of research in this field.

11.19.3 Physiology Admission Requirements and Application Procedures

Revision, October 2012. Start of revision.

11.19.3.1 Admission Requirements

Admission to the graduate program is based on an evaluation by the Graduate Student Admissions and Advisory Committee (GSAAC), and on being accepted by a research supervisor. Final acceptance is contingent upon approval of the recommendation of the applicant by Graduate and Postdoctoral Studies, from whom official notification will be received.

Candidates for the M.Sc. degree must hold a B.Sc. degree or its equivalent. Candidates who have completed an M.Sc. may be admitted directly to the Ph.D. program. M.Sc. students interested in a Ph.D. may transfer to the Ph.D. program after 12–18 months, following successful completion of all transfer requirements. The M.Sc. thesis requirement is then waived. Candidates with exceptional academic records may be considered to proceed directly to the Ph.D. degree from the B.Sc. degree.

The GRE General Test is required for anyone who does not have a degree from a North American University.

Test of English as a Foreign Language (TOEFL): minimum score of 600 on paper-based test (or 100 on the Internet-based test with each component score not less than 20). Only those whose mother tongue is English, who graduated from a North American institution (anglophone or francophone) or who completed an undergraduate or graduate degree at a foreign institution where English is the language of instruction are exempt from providing proof of competency in English.

A minimum CGPA of 3.2 or a GPA of 3.4 in the last two years is required for an application to be considered.

11.19.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

Applications should be submitted as early as possible in order to facilitate processing. However, no applications will be considered after the Dates for Guaranteed Consideration.

11.19.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Curriculum Vitae
- Personal Statement
- GRE – for applicants whose undergraduate degree is not from a North American university

11.19.3.3 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: June 1	Fall: March 15	Fall: Same as Canadian/International
Winter: Sept. 15	Winter: Sept. 15	Winter: Sept. 15
Summer: N/A	Summer: N/A	Summer: N/A

Interested candidates should refer to the Department's website www.medicine.mcgill.ca/physio for other important information.

Revision, October 2012. End of revision.

11.19.4 Physiology Faculty**Chair**

John Orłowski

Graduate Program Director

Kathleen Cullen

Emeritus Professors

Thomas M.S. Chang; B.Sc., M.D.,C.M., Ph.D.(McG.), F.R.C.P.(C)
 Kresmir Krnjevic; O.C., B.Sc., Ph.D., M.B., Ch.B.(Edin.), F.R.S.C.
 Wayne S. Lapp; M.S.A.(Tor.), Ph.D.(McG.)
 Mortimer Levy; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C) (*joint appt with Medicine*)
 George Mandl; B.Sc.(C'dia); Ph.D.(McG.)
 Geoffrey Melvill Jones; B.A., M.A., M.B., B.Ch., M.D.(Cant.)
 Joseph Milic-Emili; M.D.(Milan) (*joint appt with Medicine*)
 C. Polosa
 Douglas G.D. Watt; M.D., Ph.D.(McG.)

Professors

Monroe W. Cohen; B.Sc., Ph.D.(McG.)
 Ellis J. Cooper; B.Eng.(Sir G. Wms.), M.Sc.(Surr.), Ph.D.(McM.)
 Kathleen Cullen; B.Sc.(Brown), Ph.D.(Chic.) (*William Dawson Scholar*)
 Leon Glass; B.S.(Brooklyn), Ph.D.(Chic.) (*Rosenfield Professor of Medicine*)
 Phil Gold; M.Sc., Ph.D., M.D.,C.M.(McG.), F.R.C.P.(C.) (*Douglas G. Cameron Professor of Medicine*)
 David Goltzman; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C) (*Antoine G. Massabki Professor of Medicine*) (*joint appt. with Medicine*)
 John Hanrahan; Ph.D.(Br. Col.)
 Gergely Lukacs; M.D., Ph.D.(Budapest)
 Michael Mackey; B.A., Ph.D.(Wash.) (*Drake Professor of Medicine*)
 Sheldon Magder; M.D.(Tor.) (*joint appt. with Medicine*)
 Jacapo P. Mortola; M.D.(Milan)
 John Orłowski; B.Sc.(McG.), M.Sc., Ph.D.(Qu.) (*James McGill Professor*)
 Premysl Ponka; M.D., Ph.D.(Prague)
 Alvin Shrier; B.Sc.(C'dia), Ph.D.(Dal.) (*Hosmer Professor of Physiology*)
 John White; B.Sc., M.Sc.(Car.), Ph.D.(Harv.)

Associate Professors

Erik Cook; Ph.D.(Baylor Coll., Tx)
 Riaz Farookhi; B.Sc., M.Sc.(MIT), Ph.D.(Tufts)
 Mladen Glavinovic; B.Sc.(Zagreb), M.Sc.(Tor.), Ph.D.(McG.)
 Michael Guevara; Ph.D.(McG.)
 Pejmun Haghighi; Ph.D.(McG.)
 Sheldon Magder; M.D.(Tor.) (*joint appt. with Medicine*)
 Julio Martinez-Trujillo; Ph.D.(Tubingen)
 Ursula Stochaj; Ph.D.(Cologne)
 Teresa Trippenbach; M.D., Ph.D.(Warsaw)
 Ann Wechsler; B.A.(Tor.), M.Sc., Ph.D.(McG.)

Associate Professor - Part-Time

Nicole Bernard; B.Sc.(McG.), Ph.D.(Duke)

Assistant Professors

Maurice Chacron; Ph.D.(Ott.)

A. Chadra

Russell Jones; Ph.D.(Tor.)

R. Sharif-Naeini

A. Nyzhmyk

Associate Members*Anaesthesia:* Steven Backman, Fernando Cervero*Biochemistry:* Imed Gallouzi*Biomedical Engineering:* Robert Kearney, Satya Prakash*Electrical and Computer Engineering:* Sam Musallam*Kinesiology and Physical Education:* Dilson Rassier*Medicine:* Albert Aguauo, Volker Blank, Mark Blostein, Andrey Cybulsky, Abraham Fuks, Claude Gagnon, Raymond Gagnon, Harry L. Goldsmith, Geoffrey Hendy, Louise Larose, Anne-Marie Lauzon, James Martin, Shree Mulay, Mariana Newkirk, Barry Posner, Shafaat Rabbani, Mary Stevenson, Simon Wing, Hans Zingg*Nephrology:* Serge Lemay, Tomoko Takano*Neurology:* David Ragsdale*Neurology and Neurosurgery:* Jack Antel, Massimo Avoli, Charles Bourque, Sal Carbonetto, Daniel Guitton, Christopher Pack, Melissa Vollrath*Ophthalmology:* Curtis Baker*Otolaryngology:* Bernard Segal*Pediatrics:* Charles Rohlicek*Pharmacology:* Terence Hebert*Psychiatry:* Nicolas Cermakian, Bernardo Dubrovsky, Christina Gianoulakis**Adjunct Professors**

Roy Caplan, Pierre Drapeau, John Milton, Malmur Sairam

11.19.5 Master of Science (M.Sc.); Physiology (Thesis) (49 credits)**Thesis Courses (30 credits)**

PHGY 621	(12)	Thesis 1
PHGY 622	(15)	Thesis 2
PHGY 623	(3)	M.Sc. Seminar

Required Courses (13 credits)

PHGY 601	(1)	M.Sc. Proposal Seminar
PHGY 602	(3)	Literature Search and Research Proposal
PHGY 607	(3)	Laboratory Research 1
PHGY 608	(3)	Laboratory Research 2
PHGY 620	(3)	Progress in Research

Elective Courses (6 credits)

Students must select 6 approved credits in Physiology or Science at the 500 level or above.

11.19.6 Master of Science (M.Sc.); Physiology (Thesis) — Bioinformatics (49 credits)**Thesis Courses (30 credits)**

PHGY 621	(12)	Thesis 1
PHGY 622	(15)	Thesis 2
PHGY 623	(3)	M.Sc. Seminar

Required Courses (16 credits)

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar
PHGY 601	(1)	M.Sc. Proposal Seminar
PHGY 602	(3)	Literature Search and Research Proposal
PHGY 603	(3)	Systems Biology and Biophysics
PHGY 607	(3)	Laboratory Research 1
PHGY 608	(3)	Laboratory Research 2

Complementary Courses (3 credits)

3 credits to be chosen from the following:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics

11.19.7 Doctor of Philosophy (Ph.D.); Physiology**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (9 credits)

PHGY 701	(0)	Ph.D. Comprehensive Examination
PHGY 702	(1)	Ph.D. Proposal
PHGY 703	(1)	Ph.D. Thesis Proposal Seminar
PHGY 704	(1)	Ph.D. Thesis Proposal Seminar
PHGY 720	(1)	Ph.D. Seminar Course 1
PHGY 721	(1)	Ph.D. Seminar Course 2
PHGY 722	(1)	Ph.D. Seminar Course 3
PHGY 723	(1)	Ph.D. Seminar Course 4
PHGY 724	(1)	Ph.D. Seminar Course 5
PHGY 725	(1)	Ph.D. Seminar Course 6

Elective Courses (9 credits)

Students are required to take an additional three courses of Physiology or Science at the 500 level or above, in consultation with the GSAAC and the candidate's supervisor.

11.19.8 Doctor of Philosophy (Ph.D.); Physiology — Bioinformatics

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (15 credits)

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar
PHGY 603	(3)	Systems Biology and Biophysics
PHGY 701	(0)	Ph.D. Comprehensive Examination
PHGY 702	(1)	Ph.D. Proposal
PHGY 703	(1)	Ph.D. Thesis Proposal Seminar
PHGY 704	(1)	Ph.D. Thesis Proposal Seminar
PHGY 720	(1)	Ph.D. Seminar Course 1
PHGY 721	(1)	Ph.D. Seminar Course 2
PHGY 722	(1)	Ph.D. Seminar Course 3
PHGY 723	(1)	Ph.D. Seminar Course 4
PHGY 724	(1)	Ph.D. Seminar Course 5
PHGY 725	(1)	Ph.D. Seminar Course 6

Complementary Course (3 credits)

One course to be chosen from the following courses:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics

11.20 Psychiatry

11.20.1 Location

Department of Psychiatry
1033 Pine Avenue West
Montreal, QC H3A 1A1
Canada

Telephone: 514-398-4176

Fax: 514-398-4370

Email: graduate.psychiatry@mcgill.ca

Website: www.mcgill.ca/psychiatry

11.20.2 About Psychiatry

McGill University's Department of Psychiatry is one of the most prestigious in the world. In the 1950s and 60s, Heinz Lehmann conducted the first North American clinical trials for antipsychotic and antidepressant medications. Theodore Sourkes identified the core neurobiological features of Parkinson's disease, and Eric Wittkower and Jack Fried brought together scholars from Anthropology and Psychiatry to create Transcultural Psychiatric Studies. Since then, faculty members and graduate students continue outstanding research in addictions; Alzheimer's and childhood disorders; eating, personality, and mood disorders; stress; trauma; and psychosis. The work is conducted in people and animal models, and also benefits from expertise ranging from neuroimaging and epigenetics to mental health services and public policy. Our work remains at the cutting edge of research on health, disease, and recovery.

Ph.D. (*Ad Hoc*)

The Department of Psychiatry also offers the possibility of directly entering a Ph.D. program on an *ad hoc* basis, or, with the permission of the supervisor and the approval of the Graduate Program Director, exceptional students may transfer from the M.Sc. to the *ad hoc* Ph.D. program.

section 11.20.5: Master of Science (M.Sc.); Psychiatry (Thesis) (45 credits)

The graduate program in Psychiatry is designed to provide advanced research training in the basic, applied, and social sciences relevant to issues in psychiatry. Applicants are admitted from a wide range of backgrounds, including undergraduate degrees in relevant areas (e.g., psychology, neuroscience, sociology, medical anthropology, nursing, and medicine), and those who are pursuing their psychiatry residency at McGill. Most, though not all students, continue to a Ph.D. program. The graduate program does not provide clinical training.

11.20.3 Psychiatry Admission Requirements and Application Procedures

Revision, October 2012. Start of revision.

11.20.3.1 Admission Requirements

- A B.Sc., B.A., B.N., or M.D. degree.
- A strong background in science and/or social science, as demonstrated by academic achievement equivalent to a GPA of 3.3 (on a 4-point scale) or 3.5 in the last two years.
- A written agreement from the proposed research supervisor, and student's statement of purpose for seeking an M.Sc.
- An outline of the proposed thesis research, to be written by the prospective student in collaboration with an appropriate research supervisor.
- Two letters of reference.
- Certified proficiency in written English or French.
- TOEFL or IELTS certificate of proficiency in English for non-Canadian applicants whose mother tongue and language of education is not English, with a minimum score of 550 on the written TOEFL test, or 86 on the Internet-based test, with each component score not less than 20, or 6.5 on the IELTS test.

11.20.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See *section 6.3: Application Procedures (for All Admissions Starting Summer 2013)* for detailed application procedures.

11.20.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Personal Statement – describing the specific reasons for seeking a Master of Science degree in Psychiatry
- Letters of Reference – with Applicant Evaluation checklist forms (see Department [website](#))
- Research Proposal – to be written by the prospective student in collaboration with an appropriate research supervisor
- Written Confirmation of Supervision form (see Department [website](#)) from the proposed research supervisor

11.20.3.3 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: March 15	Fall: March 15	Fall: March 15
Winter: Sept. 15	Winter: Sept. 15	Winter: Sept. 15
Summer: Feb. 15	Summer: Jan. 15	Summer: Same as Canadian/International

Revision, October 2012. End of revision.

11.20.4 Psychiatry Faculty**Chair**

M. Israël

Vice ChairsD. Charney – *Education*G. Turecki – *Research***Chair of Graduate Program**

M. Leyton

Emeritus Professors

M.K. Birmingham; B.A.(Bennington), M.Sc., Ph.D.(McG.)

C. de Montigny; B.A., M.D.,C.D., Ph.D.(Montr.)

M. Dongier; Dip.Psych.(McG.), M.D.,C.D.(Provence-Aix-Marseilles)

G. Pinard; B.A.(Loyola), Dip. Etud. Sup., M.D.,C.M.(Montr.)

T.L. Sourkes; M.Sc.(McG.), Ph.D.(C'nell)

Professors

F. Abbott; B.Sc.(Trent), M.Sc., Ph.D.(McG.)

L. Annable; B.Sc.(Liv.), Dipl. in Stat.(Edin.)

A. Bechara; Ph.D.(Tor.)

C. Benkelfat; M.D.(Rabat) (*James McGill Professor*)

P. Boksa; B.Sc., Ph.D.(Montr.)

S. El Mestikawy; Ph.D.(U. Pierre Marie Curie)

E. Fombonne; M.D.(Paris)

N. Frasure-Smith; B.A., Ph.D.(Johns Hop.)

S. Gauthier; B.A., M.D.(Montr.)

B. Giros; M.Sc., Ph.D.(U. Pierre Marie Curie)

A. Gratton; Ph.D.(C'dia)

L.T. Hechtman; B.Sc., M.D.,C.M.(McG.)

L.J. Kirmayer; B.Sc., M.D.,C.M., Dipl.Psych.(McG.) (*James McGill Professor*)M. Leyton; Ph.D.(C'dia) (*William Dawson Scholar*)

A. Malla; B.S., M.B.(Panjab)

M.J. Meaney; B.A.(Loyola), M.A., Ph.D.(C'dia) (*James McGill Professor*)

V.N.P. Nair; M.B., B.S.(Kerala), D.P.M.(Mys.)

R. Palmour; B.A., Ph.D.(Texas)

J. Paris; M.D.,C.M.(McG.)

J.C. Perry; M.D.(Duke)

R.O. Pihl; B.A.(Lawrence), Ph.D.(Ariz.) (*Psychology*)

J. Poirier; Ph.D.(Montr.)

R. Quirion; B.Sc., M.Sc., Ph.D.(Sher.)

C. Rousseau; M.Sc.(McG.), M.D.,C.M.(Sher.)

Professors

L.K. Srivastava; B.Sc., M.Sc.(Allahabad), Ph.D.(J. Nehru)

H. Steiger; Ph.D.(McG.)

G. Turecki; M.Sc., M.D.,C.M., Ph.D.(McG.) (*William Dawson Scholar*)

C.-D. Walker; B.Sc., Ph.D.(Geneva)

A. Young; B.A., M.A., Ph.D.(Penn.)

S.N. Young; B.A.(Oxf.), M.Sc., Ph.D.(Lond.)

Associate Professors

J. Armony; B.Sc.(Buenos Aires), M.Sc., Ph.D.(NYU)

S. Beaulieu; M.D./Ph.D.(Laval)

V. Bohbot; B.A.(McG.), M.A., Ph.D.(Ariz.)

D. Boivin; Ph.D.(Montr.)

A. Brunet; Ph.D.(Montr.)

J. Caron; B.A., M.A.(Moncton), Ph.D.(UQAM)

N. Cermakian; B.Sc.(UQTR), M.Sc., Ph.D.(Montr.)

D. Charney; M.D.,C.M.(McG.)

A. Crocker; Ph.D.(Montr.) (*William Dawson Scholar*)

J.B. Debruille; M.D.(Paris), Ph.D.(U. Pierre et Marie Curie)

B.O. Dubrovsky; M.D.(Buenos Aires)

M.-J. Fleury; M.A., Ph.D.(Montr.)

G. Galbaud du Fort; M.D., Ph.D.(Paris) (*joint appt. with Epidemiology and Biostatistics*)

K.G. Gill; B.Sc.(Br. Col.), M.A., Ph.D.(C'dia)

G. Gobbi; M.D.(Rome), Ph.D.(Cagliari, Italy)

I. Gold; Ph.D.(Princ.)

B. Greenfield; M.D.(Wash.)

N. Grizenko; M.D.,C.M.(Sher.)

D. Groleau; B.Sc., M.Sc., Ph.D.(Montr.)

J. Guzder; M.D.,C.M.(McG.)

M. Israel; B.Sc., Gr.Dip.Psych.(McG.), M.A.(Qu.), M.D.,C.M.(McG.)

R. Joobar; M.D.(France), Ph.D.(Tunisia)

S. King; M.Ed., Ed.S.(James Madison Univ.), Ph.D.(Virginia Poly. Inst.)

E. Latimer; B.A.Sc.(Wat.), M.S., Ph.D.(Carn. Mell)

M. Lepage; B.A.(C'dia), Ph.D.(UQAM)

K. Looper; B.Sc., M.D.(Ott.), M.Sc.(McG.)

G. Luheshi; Ph.D.(Newcastle, UK) (*William Dawson Scholar*)

G. Myhr; M.D.,C.M., M.Sc.(McG.)

D. Pedersen; M.D.(Buenos Aires)

M. Perreault; Ph.D.(Montr.)

J. Pruessner; Ph.D.(Univ. Trier)

M.N. Rajah; B.Sc., M.A., Ph.D.(Tor.)

A. Raz; M.Sc., Ph.D.(Hebrew)

J. Rochford; M.A.(Qu.), Ph.D.(C'dia)

Associate Professors

N. Schmitz; Dipl., Ph.D.(Univ. Dortmund)
 D. Sookman; B.A.(McG.), M.A.(Guelph), Ph.D.(C'dia)
 L.K. Srivastava; B.Sc., M.Sc.(Alld.), Ph.D.(New Delhi)
 B. Thombs; B.A.(N'western), M.A.(Ariz.), Ph.D.(NYU)
 S. Williams; Ph.D.(Montr.)
 P. Zelkowitz; Ph.D.(McG.)
 M. Zoccolillo; B.Sc.(New Orleans), M.D.(Norfolk)

Assistant Professors

L. Beauclair; B.Sc., M.D.(Laval)
 P. Beaudry; M.D.(Sher.), Dipl.Psych.(McG.)
 D. Bloom; B.Sc.(Regina), M.D.(Qu.)
 T.G. Brown; Ph.D.(C'dia)
 K. Bruce; Ph.D.(McG.)
 D.M. Dunkley; B.Sc.(Tor.), Ph.D.(McG.)
 C. Flores; Ph.D.(C'dia)
 Y. Goto; B.S.(Tokyo), M.Sc., Ph.D.(Albany)
 R. Gruber; B.A., M.S., Ph.D.(Tel Aviv)
 M. Habra; B.A.(McG.), M.A., Ph.D.(Br. Col.)
 G.E. Jarvis; B.M.S., M.D.(Alta.)
 F. Jollant; M.D.(Paris), M.Sc., Ph.D.(Montpellier)
 A. Labbe; M.Sc.(Montr.), Ph.D.(Wat.)
 E. Loucks; B.Sc., Ph.D.(Br. Col.)
 N.C.P. Low; M.D., M.Sc.(McG.)
 T. Measham; B.Sc., M.D.(McG.)
 N. Mechawar; B.Sc., M.Sc., Ph.D.(Montr.)
 L. Nadeau; M.D.(Montr.)
 M. Piat; Ph.D.(Laval)
 J. Renaud; M.Sc., M.D.(Montr.)
 R. Rodriguez; M.D., MPH(Spain), Ph.D.(Montr.)
 K. Storch; M.Sc.(Munich); Ph.D.(Max Planck Inst. Biochem.)
 R. Sullivan; Ph.D.(McM.)
 A. Wazana; B.A.(McM.), M.Sc.(Col.), M.Sc.(McG.), M.D.(McM.)
 R. Whitley; B.S., M.S., Ph.D.(Lond)
 T.P. Wong; B.Sc.(HK), Ph.D.(McG.)

Associate Members

J.L. Derevensky
 A. Evans
 R.O. Pihl (*Psychology*)

Adjunct Professors

M. Alda

Adjunct Professors

P. Blier
 L. Booij
 W. Brender
 M. Cargo
 A. Duffy
 V. Kovess
 J-C. Lasry

11.20.5 Master of Science (M.Sc.); Psychiatry (Thesis) (45 credits)

The M.Sc. in Psychiatry is administered by the Graduate Training Committee. Each student selects a Supervisory Committee composed of the research supervisor plus two to four other faculty who are knowledgeable about the student's research area and who can advise both on appropriate coursework and on the thesis research project. The student will meet with this Supervisory Committee at least once during each year of matriculation for the purpose of evaluating academic and research progress of the student. The Supervisory Committee will also act as a resource body for the student, both with respect to academic and administrative matters.

Thesis Courses (36 credits)

PSYT 691	(12)	Thesis Research 1
PSYT 692	(12)	Thesis Research 2
PSYT 693	(12)	Thesis Research 3

Complementary Courses (9 credits)

9 credits of graduate-level courses approved by the student's Supervisory Committee.

Courses are selected on the basis of the area of research interest and the background of the student, and must include a course in statistical analysis if not presented upon admission.

11.21 Surgery, Experimental (Division of Surgical Research)**11.21.1 Location**

Surgery, Experimental (Division of Surgical Research)
 Montreal General Hospital, Room C9-169
 1650 Cedar Avenue
 Montreal, QC H3G 1A4
 Canada

Telephone: 514-934-1934 ext. 42837
 Fax: 514-934-8289
 Email: gradstudies.surgery@mcgill.ca
 Website: www.surgery-research.mcgill.ca

11.21.2 About Experimental Surgery

The Department of Experimental Surgery offers graduate programs leading to M.Sc. and Ph.D. degrees. The Experimental Surgery department is responsible for the administration of the graduate programs and allows excellent opportunities for training under the supervision of professors located in the research institutes of the different McGill teaching hospitals. The scope of the research and close connections with other centres and departments of McGill provide ample opportunities for collaboration. The research in the Department covers a broad range of topics from repair and regeneration to cancer cell biology and sexual dysfunction. Research interests include studies of wound healing, scarring and skin tissue engineering, receptors and signal transduction pathways, cartilage repair and osteoarthritis, islet cell differentiation and islet transplantation, tissue engineering of cardiac muscle, immunopathogenesis of liver xenograft rejection, osteoinduction and biomechanics, sepsis and multi-organ failure, biology of cancer, sexual dysfunction and prostate cancer, and surgical health outcomes.

A list of research directors and a description of their research topics, as well as application forms may be obtained from our website (www.surgery-research.mcgill.ca).

section 11.21.5: Master of Science (M.Sc.); Experimental Surgery (Thesis) (Surgical Research) (48 credits)

The M.Sc. program is intended for students wishing to pursue careers in academia, the medical field, or industry. Thesis projects available in the various laboratories of the Department are multidisciplinary and ensure that students are exposed to a broad spectrum of research projects and experimental approaches. Students who have achieved superior progress in their research have the option to transfer to the Ph.D. program, waiving the M.Sc. thesis submission.

section 11.21.6: Doctor of Philosophy (Ph.D.); Experimental Surgery (Surgical Research)

The doctoral program is intended for students with excellent Academic Standing who wish to pursue research-focused careers in academia, the medical field, or industry. Thesis projects, available in the various laboratories of the Department, are multidisciplinary and provide in-depth training, ensuring that students are exposed to a broad spectrum of research projects and experimental approaches.

section 11.21.7: Graduate Diploma in Surgical Health Care Research (30 credits)

The graduate diploma program is open to all graduate students in the Division of Surgical Research, but is specifically designed for surgical residents who have allotted time during their residency training. The intention of the program is to train students to become researchers in the interdisciplinary field of surgical health outcomes. The students will receive training strategies for experimental design, analysis of data sets, modelling techniques, and use of algorithms and statistics. Upon completion of this program, students are expected to be proficient in the concepts, language, approaches, and limitations of the field.



Note: No admissions for 2012–2013.

11.21.3 Experimental Surgery (Division of Surgical Research) Admission Requirements and Application Procedures

11.21.3.1 Admission Requirements

Revision, October 2012. Start of revision.

M.Sc. Program

Usually a B.Sc., M.D., or D.V.M. degree is required, with a minimum CGPA of 3.2/4.0. Applications will be accepted from candidates sponsored by a research supervisor willing to provide laboratory space and direction for their research work.

Ph.D. Program

Admission is usually from the M.Sc. program either upon completion of the M.Sc. degree, or by transfer from the first year of M.Sc. to the second year of Ph.D. studies. Request for such transfer is to be made in writing by the thesis supervisor during the candidate's first year of M.Sc. studies, not later than March 30 for students enrolled in September, or October 15 for those registered in January. The student must then apply for admission to the Ph.D. program in order to effect the transfer. **Transfer is granted on the basis of an examination administered by the student's Research Supervisory Committee.** Exceptional students with a minimum 3.5/4.0 CGPA may apply directly to the Ph.D. program. Students must apply for admission to transfer to the Ph.D. by the Date for Guaranteed Consideration.

Students with an M.Sc. degree from other departments or from other recognized universities whose M.Sc. topic is closely related to the subject of their Ph.D. research may be admitted directly into the Ph.D. program, at the level of Ph.D. 2, at the discretion of the Department. Exceptional students with a master's degree unrelated to their proposed research may be admitted to Ph.D. 1.

Graduate Diploma in Surgical Health Care Research

The program is open to all graduate students in the Division of Surgical Research, but is specifically designed for surgical residents who have allotted time during their residency training. To be accepted into the Graduate Diploma program, students must be accepted into the Division of Surgical Research, fulfil the minimum requirements for admission to Graduate and Postdoctoral Studies, identify an acceptable and feasible research project, and identify an accredited faculty member willing to support the research and supervise the student.



Note: No admissions for 2012–2013.

11.21.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

See [section 6.3: Application Procedures \(for All Admissions Starting Summer 2013\)](#) for detailed application procedures.

11.21.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Curriculum Vitae

- Research Proposal
- Letter of Intent and Memorandum of Agreement from the prospective Thesis Supervisor

11.21.3.3 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: June 1	Fall: Apr. 20	Fall: Same as Canadian/International
Winter: Sept. 15	Winter: Sept. 15	Winter: Sept. 15
Summer: N/A	Summer: N/A	Summer: N/A

Revision, October 2012. End of revision.

11.21.4 Surgery, Experimental (Division of Surgical Research) Faculty

Director

L. Rosenberg

Associate Director

A. Philip

Administrative & Student Affairs Coordinator

Damla Tahirbegi

514-934-1934 ext. 42837

Professors

J.D. Boby; B.Sc., M.Sc.(McG.), Ph.D.(Tor.)

P. Brodt; B.Sc.(Bar-Ilan), M.Sc.(Ott.), Ph.D.(McG.)

R.C.-J. Chiu; M.B.(Taiwan), Ph.D.(McG.)

N.V. Christou; B.Sc., M.Sc., Ph.D., M.D.,C.M.(McG.)

M.M. Elhilali; M.B., B.Ch., D.S., DU, M.Ch.(Cairo), Ph.D.(McG.)

G.M. Fried; B.Sc., M.D.,C.M.(McG.)

F. Glorieux; M.D.(Louvain), M.Sc.(Montr.), Ph.D.(McG.)

P.H. Gordon; M.D.(Sask.)

J.E. Henderson; Ph.D.(McG.)

J.M. Laberge; M.D.(Laval)

D.S. Mulder; M.D.(Sask.), M.Sc.(McG.)

L. Rosenberg; M.Sc., M.D., Ph.D.(McG.)

P.J. Roughley; B.Sc., Ph.D.(Nott.)

R. St. Arnaud; Ph.D.(Laval)

M. Tanzer; M.D.,C.M.(McG.), F.R.C.S.(C)

C.I. Tchervenkov; B.Sc., M.D.,C.M.(McG.), F.R.C.S.(C)

Associate Professors

J. Antoniou; M.D.,C.M., Ph.D.(McG.), F.R.C.S.(C)

J. Barkun; M.D., M.Sc.(McG.)

O. Blaschuk; B.Sc.(Winn.), M.Sc.(Manit.), Ph.D.(Tor.)

S. Chevalier; B.Sc., M.Sc., Ph.D.(Montr.)

Associate Professors

S. Emil; M.D.,C.M.(McG.), F.R.C.S.(C)
 L. Feldman; M.D.,C.M., M.Sc.(McG.)
 D. Fleischer; B.Sc., M.D.,C.M.(McG.)
 R.C. Hamdy; M.Sc, M.D.(Egypt), F.R.C.S.(C)
 E. Harvey; B.Sc.(Ont.) M.D.,C.M., M.Sc.(McG.)
 K.J. Lachapelle; M.Sc., M.D.,C.M.(McG.)
 L. Lessard; B.Sc., M.D.(Laval), F.R.C.S.(C)
 S. Meterissian; M.D.,C.M., M.Sc.(McG.)
 P. Metrakos; B.Sc., M.D.(McG.), F.R.C.S.(C)
 J.S. Mort; B.Sc.(McG.), Ph.D.(McM.)
 A. Philip; M.Sc., Ph.D.(McG.)
 P. Puligandla; M.D., M.Sc.(W. Ont.), F.R.C.S.(C)
 J. Sampalis; M.Sc., Ph.D.(McG.)
 D. Shum-Tim; M.Sc., M.D.,C.M.(McG.)
 T. Steffen; M.D.(Switz.), Ph.D.(McG.)
 T. Taketo-Hosotani; B.Sc., M.Sc., Ph.D.(Kyoto)
 J.I. Tchervenkov; M.D.,C.M.(McG.), F.R.C.S.(C)
 R. Turcotte; M.D.(Montr.)
 D. Zukor; B.Sc., M.D.,C.M.(McG.)

Assistant Professors

J.E. Barralet; B.Eng., Ph.D.(Lond.)
 M. Basik; M.D.,C.M.(McG.)
 S. Bergman; M.Sc., M.D.,C.M.(McG.), F.R.C.S.(C)
 J. Chen; B.Sc.(Chin. Acad. Sci.), Ph.D.(Guelph)
 M. Chevrette; B.Sc., M.Sc., Ph.D.(Laval)
 N. Eliopoulos; B.Sc.(McG.), M.Sc., Ph.D.(Montr.)
 J. Faria; M.D.,C.M., M.Sc.(McG.), F.R.C.S.(C)
 L. Ferri; M.D.,C.M., M.Sc.(McG.)
 S. Fraser; B.Sc., M.D.(Tor.), M.Sc.(McG.), F.R.C.S.(C)
 M. Gilardino; M.D.,C.M., M.Sc.(McG.), F.R.C.S.(C), F.A.C.S.
 T.E. Hebert; Ph.D.(Tor.)
 O. Huk; B.Sc., M.D.,C.M.(McG.), M.Sc.(Montr.)
 P. Jarzem; B.Sc., M.D.(Qu.)
 J. Lapointe; M.D., Ph.D.(Laval)
 E. Lee; B.A.(Boston), M.Sc., Ph.D.(McG.)
 C. O'Flaherty; D.V.M., Ph.D.(Buenos Aires, Argentina)
 S. Paraskevas; M.D., Ph.D.(McG.)
 M. Petropavlovskaja; M.Sc., Ph.D.(Moscow)
 A.D. Recklies; B.Sc.(McG.), Ph.D.(McM.)
 K. Shaw; M.D.,C.M., M.Sc.(McG.)

11.21.5 Master of Science (M.Sc.); Experimental Surgery (Thesis) (Surgical Research) (48 credits)**Thesis Courses (33 credits)**

EXSU 690	(4)	M.Sc. Research 1
EXSU 691	(4)	M.Sc. Research 2
EXSU 692	(4)	M.Sc. Research 3
EXSU 693	(21)	M.Sc. Thesis

Required Courses (12 credits)

EXSU 601	(6)	Knowledge Management
EXSU 605	(3)	Biomedical Research Innovation
EXSU 606	(3)	Statistics for Surgical Research

Complementary Courses (3 credits)

3 credits, one graduate-level course in the student's specialty, selected in consultation with the Research Supervisory Committee.

Depending on their individual background, students may be asked by their Research Supervisory Committee to take additional courses.

11.21.6 Doctor of Philosophy (Ph.D.); Experimental Surgery (Surgical Research)**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (12 credits)

EXSU 601	(6)	Knowledge Management
EXSU 605	(3)	Biomedical Research Innovation
EXSU 606	(3)	Statistics for Surgical Research
EXSU 700	(0)	Comprehensive Examination

Complementary Course (3 credits)

One graduate-level course in the student's specialty, selected in consultation with the Research Supervisory Committee.

11.21.7 Graduate Diploma in Surgical Health Care Research (30 credits)**Project (9 credits)**

EXSU 637	(9)	Research Project
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Required Courses (9 credits)

EXSU 601	(6)	Knowledge Management
EXSU 606	(3)	Statistics for Surgical Research

Complementary Courses (12 credits)

At least 3 credits from the following courses:

EPIB 631*	(2)	Pharmacoepidemiology 2
EPIB 633*	(2)	Pharmacoepidemiology 1
EPIB 656	(3)	Health Care Technology Assessment
EPIB 679	(3)	Special Topics 10
EXMD 631	(3)	Topics in Economic Evaluation

Note: EPIB 631 and EPIB 633 must be taken in tandem for a total of four credits.

At least 9 credits from the following courses:

EPIB 601	(4)	Fundamentals of Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 610	(3)	Advanced Methods: Causal Inference
EPIB 631*	(2)	Pharmacoepidemiology 2
EPIB 633*	(2)	Pharmacoepidemiology 1
EPIB 643	(1)	Substantive Epidemiology 3
EPIB 655	(3)	Epidemiology in Public Health
EPIB 668	(2)	Special Topics 1
EXMD 631	(3)	Topics in Economic Evaluation
POTH 630	(3)	Measurement: Rehabilitation 2

Note: EPIB 631 and 633 must be taken in tandem for a total of four credits.