17 Communication Sciences and Disorders

School of Communication Sciences and Disorders
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Director
Rachel Mayberry

Research Director — Vincent Gracco

17.1 Staff

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

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

Associate Professors
Shari Baum; B.A.(C'nell), M.S.(Vt.), M.A., Ph.D.(Brown)
Martha Crago; B.A., M.Sc.A., Ph.D.(McG.)
Vincent Gracco; B.A., M.A.(San Diego), Ph.D.(Wis.-Madison)
Rachel Mayberry; B.A.(Drake), M.S.(Wash.), Ph.D.(McG.)
James McNutt; B.S.(Edin.). M.Ed.(Penn. St.), Ph.D.(Kent St.)
Linda Polka; B.A.(Slippery Rock), M.A.(Minn.), Ph.D.(S.Flor.)

Assistant Professors (Special Category)
Marc Pell; B.A.(Ott.), M.Sc., Ph.D.(McG.)
Susan Rvachew; B.Sc.(Alta.), M.Sc., Ph.D.(Calgary)
Elin Thordardottir; B.A., M.Sc., Ph.D.(Wis.-Madison)

Assistant Professors (Part-Time)
Gabriel Leonard; B.A.(Dublin), D.A.P., M.Sc., Ph.D.(McG.)
Sybil Schwartz; B.Sc.(McG.), M.Sc.A.(Iowa St.), Ph.D.(McG.)
Rosalee Shenker; B.Sc.(Syr.), M.A.(Calif. St.), Ph.D.(McG.)

Faculty Lecturer
Jeanne Claessen; M.A.(Reading), Dip. Clinical Communication Studies (City University, London)

Faculty Lecturers (Part-Time)
Patrick Boudreault; B.A.(Montr.), M.Sc.(McG.)
Joane Déziel; B.Sc, M.Sc.(Montr.)
Ruth Gesser; B.A.(C'dia), M.Sc.A.(McG.)
Jill Harrisson; B.A., M.Sc.(McG.)
Helena Kisilevsky; B.A.(McG.), M.A.(UCLA), M.O.A.(Montr.)
Judith Robillard-Shultz; B.A., M.Sc.A.(McG.)
Navid Shahnaz; B.Sc.(Iran), M.Sc.(McG.)
Megha Sundara; B.Sc., M.Sc.(All India Inst. of Speech & Hearing)
Colleen Timm; B.A.(C'dia), M.Sc.A.(McG.)

Associate Member
Yuriko Oshima-Takane (Psychology)

Adjunct Members
David Caplan *(Harvard)*; B.Sc., Ph.D.(M.I.T.), M.D.,C.M.(McG.)
Howard Chertkow *(Jewish Gen.)*; M.D.(W. Ont.), F.R.C.P. (Neurology)
David McFarland *(U. of Montreal)*; B.A., M.A.(Calif. St.), Ph.D.(Purdue)

17.2 Programs Offered

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.

Please note: The Audiology specialization of the M.Sc. (Applied) program has been suspended indefinitely.

M.Sc.(Applied) Degree in Communication Sciences and Disorders

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.

Requirements for Licensure – The majority of provinces in Canada and certain states in the U.S.A. require that those intending to practice as Speech-Language Pathologists within their borders comply with special provincial or state licensing regulations. Graduates wishing to practice in the province of Quebec must be members of l'Ordre des Orthophonistes et Audiologistes du Québec (OOAQ) in order to call themselves Speech-Language Pathologists. Further information is available from the OOAQ, 1265 rue Berri, Bureau 730, Montreal, Quebec, H2L 4X4. Telephone: (514) 282-9123.

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 Information and Regulations Section.

Research Degrees – M.Sc. and Ph.D.

Selected candidates may be accepted for the M.Sc. and Ph.D. research degrees. 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.

Ph.D. Option in Language Acquisition (LAP)
Information about this option is available from the School and on the following website: http://www.psych.mcgill.ca/lap/html.

Funding

The IODE Provincial Chapter of Quebec funds two $1,000 "Silence to Sound" awards for studies in hearing impairment. These in-course awards based on academic merit, financial need, and potential for excellence 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.

17.3 Admissions Requirements

M.Sc.(Applied)

An applicant must hold an undergraduate degree with a minimum B average (3.0 on a 4 .0point scale) or better in areas relevant to the selected field of specialization. Specific prerequisites are six credits in statistics, 12 credits in psychology, and six credits in linguistics. 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 in the School ("fast-track" option).

17.4 Application Procedures

M.Sc.(Applied)

The complete application should be submitted directly to the School's Admissions Secretary and must be received by February 1, or it may not be considered for the following academic year. Applications will be considered upon receipt of:

1. completed application and information forms
2. two official copies of all university transcripts (only one official transcript from McGill University)
3. two letters of recommendation from professors (on the appropriate forms)
4. listing of relevant courses completed and in progress, relevant experience, and publications
5. statement of interest
6. a $60 application fee (money order, certified cheque or credit card - Amex, MC, Visa)
7. students living outside of Canada whose first language is not English and who have not received university education in English must also provide official reports of their score on the "Test of English as a Foreign Language" (TOEFL). A score of 550 or better on the paper-based test (213 on the computer-based test) is required for admission.

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

Applications should be submitted directly to the School's Admissions Secretary. Applications are processed when they are received. However, students must apply no later than February 22 for fall admission, October 25 for winter admission, and January 25 for summer admission. Students who are accepted early for the fall admission generally have the most options with respect to applying for external funding.

Applications will be considered upon receipt of:

1. to 7. as above, plus
8. Students who have completed any of their post-secondary education outside of Canada or the United States, must submit official reports of their performance on the General Graduate Record Examination (GRE). Applicants should send a photocopy of their personal report as soon as it is received.

   Other applicants are also strongly encouraged to submit reports of their performance on the GRE.

17.5 Program Requirements

M.SC.(APPLIED) DEGREE IN COMMUNICATION SCIENCES AND DISORDERS (68 credits)

The professional degree program leads to a Master of Science, Applied degree in Communication Sciences and Disorders 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.

Please note: The Audiology specialization of the M.Sc. (Applied) program has been suspended indefinitely.

M.Sc.(Applied) – Speech-Language Pathology Specialization

Year 1 Required Courses (31 credits)
401-616A (3) Audiology
401-617A (3) Anatomy & Physiology of Speech & Hearing
401-619A (3) Phonological Development
401-624A (3) Language Processes
401-633A (3) Language Development
401-681A (1) Practicum and Seminar I
401-631B (3) Speech Science
401-632B (3) Phonological Disorders in Children
401-637B (3) Developmental Language Disorders I
401-638B (3) Neurolinguistics
401-682B (1) Practicum and Seminar II
401-646C (2) Clinical Practicum

Year 1 Complementary Course (3 credits)
One three-credit seminar option must be taken.

Year 2 Required Courses (31 credits)
401-618A (3) Research & Measurement Methodologies
401-636A (3) Fluency Disorders
401-639A (3) Voice Disorders
401-643A (3) Developmental Language Disorders II
401-644A (3) Applied Neurolinguistics
401-683A (1) Practicum and Seminar III
401-609B (3) Neuromotor Disorders
401-642B (3) Aural Rehabilitation
401-668B (3) Communicatively Disordered Person: Practice
401-669B (3) Special Developmental Speech/Language Problems
401-684B (1) Practicum and Seminar IV
401-679C (2) Advanced Clinical Practicum

Year 2 Complementary Course (3 credits)
One three-credit seminar option must be taken.

M.Sc.(Applied) Complementary Course List
401-634B (3) Research & Measurement Methodologies II
401-649B (3) Psycholinguistics of Gesture & Sign Language
401-664B (3) Topics in Comm. Sciences & Disorders I
401-666B (3) Topics in Comm. Sciences & Disorders III
401-667B (3) Topics in Comm. Sciences & Disorders IV
401-670B (3) Topics in Comm. Sciences & Disorders II

A seminar may also be taken outside of the School upon approval of a faculty advisor.

M.SC. IN COMMUNICATION SCIENCES AND DISORDERS (45 credits)

M.Sc. candidates must complete at least 4 5credits, including a minimum of 24 and a maximum of 3 9credits for thesis research (courses 401-671, 401-672, 401-673 and 401-674), and a minimum of 6 credits in other courses. The non-thesis credits can be special topic courses in the School and/or courses in other departments, as arranged with the student's thesis supervisor.

Thesis Component – Required (24 credits)
401-671 (12) M.Sc. Thesis I
401-672 (12) M.Sc. Thesis II

Complementary Courses (21 credits)
a maximum of 15 credits may be chosen from:
401-673 (12) M.Sc. Thesis III
401-674 (3) M.Sc. Thesis IV
a minimum of 6 credits must be chosen from:
401-675D,A,B,C (12) Special Topics I
401-676D,A,B,C (9) Special Topics II
401-677D,A,B,C (6) Special Topics III
401-678A,B (3) Special Topics IV
or courses in other departments, as arranged with the student's thesis supervisor

PH.D. IN COMMUNICATION SCIENCES AND DISORDERS

Ph.D. students must complete a full graduate course in statistics and both advanced research seminars as well as the other course requirements in their individual program of study, and pass a comprehensive examination. Students entering the Ph.D. program through the fast-tract option must additionally demonstrate the

ability to complete a research project and related coursework during the initial year. An examination in a foreign language is not required.

Required Courses

401-652A,B	(3)	Advanced Research Seminar I
401-653A,B	(3)	Advanced Research Seminar II
401-685A,B,C,T	(3)	Research Project I
401-686A,B,C,T	(3)	Research Project II
401-701A,B,D		Doctoral Comprehensives

17.6 Courses

The letters which form part of the course numbers have the following significance:

A – fall term
B – winter term
C – summer session courses starting in May
D – fall and winter term

The names of course instructors are listed on the Course Timetable available on ***info*McGill** via the Web http://www.mcgill.ca/students/courses/.

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

401-609B NEUROMOTOR DISORDERS. (3) The focus of this course will be on the assessment and management of motor speech disorders, associated with both acquired and developmental neuromotor disorders, and swallowing disorders (of both neuromotor and structural origin).

401-616A AUDIOLOGY. (3) Basic diagnostic and rehabilitative procedures, goals and procedures used in clinical audiology, and the psychoacoustic theories on which they are based will be presented.

401-617A ANATOMY AND PHYSIOLOGY OF SPEECH AND HEARING. (3) The anatomy and physiology of speech and hearing mechanisms will be covered. Topics will include neuroanatomy, the anatomy and physiology of the head, neck and upper torso, and the external, middle, and inner ear.

401-618A RESEARCH AND MEASUREMENT METHODOLOGIES I. (3) Methodologies used in research and measurement in the field of communication sciences and disorders will be introduced. Topics covered include: the nature and interpretation of test norms; validity; interpretation of test score differences; and questionnaire development (scaling). Tests currently used in speech-language pathology and audiology are examined.

401-619A PHONOLOGICAL DEVELOPMENT. (3) Theories and research related to normal and abnormal phonological development in children will be studied.

401-624A LANGUAGE PROCESSES. (3) The structure and nature of on-line processing of the language code, and the interaction of structure and function of language will be studied. Theories about the nature of representation and research concerning its processing, and the role of sociocultural factors in linguistic performance also will be covered.

401-631B SPEECH SCIENCE. (3) The acoustic analysis and perception of speech and related pathologies will be presented. Theories and models of speech production, speech motor control, and speech perception will be considered.

401-632B PHONOLOGICAL DISORDERS IN CHILDREN. (3) The nature of phonological disorders and clinical approaches for their remediation in children will be presented.

401-633A LANGUAGE DEVELOPMENT. (3) Theories of language acquisition, prerequisites to language development, and current issues in research will be studied. Topics include the role of input, individual differences in acquisition, and language socialization.

401-634B RESEARCH AND MEASUREMENT METHODOLOGIES II. (3) This course addresses the strengths and weaknesses of various research designs. Issues concerning the analysis and interpretation of research results also will be discussed.

401-636A FLUENCY DISORDERS. (3) The nature of stuttering, various causal theories, and techniques for evaluation and treatment of children and adults will be presented.

401-637B DEVELOPMENTAL LANGUAGE DISORDERS I. (3) The nature of developmental language disorders and the assessment of language competence and performance in both speaking and non-speaking children will be studied.

401-638B NEUROLINGUISTICS. (3) Current theories of language-brain relationships and speech and language deficits subsequent to brain damage will be studied. A review of current research on phonetic, lexical, and syntactic processing in brain-damaged individuals is included.

401-639A VOICE DISORDERS. (3) Information about the vocal mechanism, its pathologies, and methods of evaluation and treatment will be studied.

401-642B AURAL REHABILITATION. (3) This course addresses the effects of hearing impairment in adults as well as in the developing child with attention to problems in speech, language, and cognitive function as well as social-emotional adjustment. Various intervention approaches are examined.

401-643B DEVELOPMENTAL LANGUAGE DISORDERS II. (3) Major theories of language disorders are translated into intervention principles used in language treatment programs. Adaptations of intervention techniques to suit specific disorders (including augmentative communication) will be explored.

401-644A APPLIED NEUROLINGUISTICS. (3) Various classificatory systems and appropriate assessment and remediation principles for brain-damaged individuals will be covered. Theoretical and clinical issues relevant to treatment of aphasic, neuromotor, and memory disorders will be considered.

401-646C CLINICAL PRACTICUM. (2) This course provides an introduction to professional practice through intensive exposure to a variety of clinical populations.

401-649B PSYCHOLINGUISTICS OF GESTURE AND SIGN LANGUAGE. (3) Gestured under two naturally occurring conditions is examined: (1) spontaneous speech where gesture serves as an adjunct to communication, and (2) sign language where gesture is the primary means of communication. The development of these gestural phenomena in the absence and presence of various communication disorders is also examined.

401-652A,B ADVANCED RESEARCH SEMINAR I. (3) Pro seminar in which current research topics in communication disorders will be discussed. (This course may be taken as an advanced course for M.Sc. students.)

401-653A,B ADVANCED RESEARCH SEMINAR II. (3) Pro seminar in which current research topics in communication disorders will be discussed. (This course may be taken as an advanced course for M.Sc. students.)

401-664B TOPICS IN COMMUNICATION SCIENCES AND DISORDERS I. (3) Current research and professional issues in communication sciences and disorders will be discussed. Specific topics to be selected yearly.

401-666B TOPICS IN COMMUNICATION SCIENCES AND DISORDERS III. (3) Current research and professional issues in communication sciences and disorders will be discussed. Specific topics to be selected yearly.

401-667B TOPICS IN COMMUNICATION SCIENCES AND DISORDERS IV. (3) Current research and professional issues in communication sciences and disorders will be discussed. Specific topics to be selected yearly.

401-668B COMMUNICATIVELY DISORDERED PERSON: PRACTICE. (3) This course addresses clinical and supervisory processes, the social and emotional impact of communicative disabilities, and professional issues related to the practice of speech-language pathology and audiology.

401-669B SPECIAL DEVELOPMENTAL SPEECH/LANGUAGE PROBLEMS. (3) Information pertinent to cerebral palsy, cleft palate, autism, mental retardation, multiple handicaps and syndromes

involving speech and language disorders will be presented. General descriptions of the disorders and specific assessment and remedial procedures will be addressed.

401-670B TOPICS IN COMMUNICATION SCIENCES AND DISORDERS II. (3) Current research and professional issues in communication sciences and disorders will be discussed. Specific topics to be selected yearly.

401-679C ADVANCED CLINICAL PRACTICUM. (2) This course enhances professional practice independence through intensive exposure to a variety of clinical populations.

401-681A PRACTICUM AND SEMINAR I. (1) Course provides initial practicum experiences including a combination of the following: speech/language and hearing screenings, facility tours, short term placements and laboratory assignments.

401-682B PRACTICUM AND SEMINAR II. (1) This course provides clinical experience through short-term placements and screenings, as well as discussions of current practicum issues.

401-683A PRACTICUM AND SEMINAR III. (1) Professional practice experiences focusing on a variety of clinical populations are provided. Discussion of advanced issues in clinical practice is included.

401-684B PRACTICUM AND SEMINAR IV. (1) This course provides clinical practicum experiences in a range of settings. Professional practice issues are considered.

401-685A,B,C,T RESEARCH PROJECT I. (3) Supervised research project.

401-686A,B,C,T RESEARCH PROJECT II. (3) Supervised research project.

18 Communication Studies

Department of Art History and Communication Studies
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Chair — Christine Ross *(on leave Jan.-Dec. 2001)*

Director, Graduate Programs in Art History — Hans J. Böker
Director, Graduate Programs in Communication — Will Straw

18.1 Staff

Emeritus Professors
John M. Fossey; B.A.(Birm.), D.U.(Lyon II), F.S.A., R.P.A.
George Galavaris; M.A.(Athens), M.F.A., Ph.D.(Prin.), F.R.S.C.
George Szanto; B.A.(Dart.), Ph.D.(Harv.)

Professor
Hans J. Böker; Ph.D.(Saarbrücken), Dr. Ing.-habil(Hannover)

Associate Professors
David Crowley; B.A.(Johns H.), M.Sc.(Penns.), Ph.D.(McG.)
Christine Ross; M.A.(C'dia.), Ph.D.(Paris I) *(on leave Jan. to June 2001)*
Will Straw; B.A.(Carl.), M.A., Ph.D.(McG.)

Assistant Professors
Ting Chang; B.A.(McG.), M.A.(Tor.), Ph.D.(Sussex)
Sheryl N. Hamilton; L.L.B.(Sask.), B.A., M.A.(Carl.), Ph.D.(C'dia)
Bronwen Wilson; B.A., M.A.(U.B.C.), Ph.D.(Northwestern)

Assistant Professor (Special Category)
Johanne Sloan; B.F.A.(C'dia), M.A.(Montr.), Ph.D.(Kent)

Adjunct Professors
David W. Booth; B.A., M.A., M.Phil., Ph.D.(Tor.)
Johanne Lamoureux; B.A., M.A.(Montr.), Ph.D.(E.H.E.S.S., Paris)
Louis De Moura Sobral; M.A., Ph.D.(Louvain)
Grant McCracken; B.A.(Antioch), M.A., Ph.D.(Chic.)
Don McGregor; B.A.(Tor.), M.A.(Carl.), Federal Government Interchange Canada
Constance Naubert-Riser; B.A., M.A.(Ott.), Ph.D.(Lyon III)
Jocelyne Picot; B.A.(Montr.), M.A.(Con.), Ph.D.(S. Fraser)

18.2 Programs Offered

The Communication Studies Program offers courses and directs project research in preparation for the M.A. (Thesis and Non-thesis options) and Ph.D. in Communications.

The Program is concerned with the study of communications phenomena through an interdisciplinary activity that includes both theoretical and practical considerations of the various modes and media of communication. The Program does not provide the purely technical training which can be more appropriately carried out by institutions of technology and communication arts, rather the focus is on broadening the understanding of the interplay between practical needs and theoretical perspectives. The special theoretical interest of the Program centres on the nature and scope of human communications as they emphasize the relationship of cognitive, social and aesthetic problems.

The Program is subdivided into the following areas: Cultural Theory and Cultural Practice, History and Theory of Communications, Media Studies. Degree candidates are encouraged to explore these aspects of communication studies by drawing upon the resources of the various departments throughout the University with which the Program has established close working relations. For more information on the Program, please visit our website.

A number of financial aid opportunities and scholarships are available to Graduate students, some from the University itself (Teaching and Research Assistantships, McGill Major Fellowships), and others from governmental agencies. Application deadlines are early in the Fall. Information on eligibility can be obtained from the Program or through the Graduate Faculty's Fellowships Office, McGill University, James Administration Building, Room 400, 845 Sherbrooke Street W., Montreal, Quebec, H3A 2T5. (514) 398-3990. (http://www.mcgill.ca/fgsr/fellowl.htm)

For programs in Art History refer to section 7.

18.3 Admission Requirements

M.A.
An Honours Bachelor's degree or equivalent is required of applicants for the M.A. program with a minimum CGPA of 3.3 on 4.0. In any case, the transcript must show breadth or depth in related areas of study.

Ph.D.
Applicants for the Ph.D. program are expected to have completed the equivalent of an M.A. degree. Admission will be based on academic achievement and evidence of talent and strong motivation in communications studies.

18.4 Application Procedures

Applications will be considered upon receipt of:

1. Application form.
2. $60 application fee.
3. Transcripts (2 official copies).
4. Letters of Recommendation (2 official letters).
5. Written samples (2 samples, English or French translations).
6. Statement of Interest (4 copies).
7. Proof of Citizenship.
8. TOEFL (minimum score of 550 on paper-based test or 213 on the computer-based test).

Deadline for application is January 15.

Inquiries regarding the Program should be addressed to the Admissions Coordinator, Department of Art History and Communication Studies, McGill University, 853 Sherbrooke Street West, Montreal, QC H3A 2T6.

18.5 Program Requirements

M.A. Degree (48 credits)

The Master's Program consists of a three-semester program of courses. Successful completion of the M.A. requires either:

a) **Thesis option:** a total of 8 courses (24 credits) and a thesis (equivalent to 24 credits), or

b) **Non-Thesis option:** a total of 12 courses (36 credits) and two research projects (equivalent to 12 credits);

and the fulfilment of a language requirement.

Ph.D. Degree

Candidates with an M.A. will be admitted into Phase II of the doctoral program, thereby gaining credit for one year of resident study. Three years of residence are normally required for the Doctoral degree. The program of study is comprised of three or more projects, the fulfillment of a language requirement and a written dissertation.

18.6 Courses Offered

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

The names of course instructors are listed on the Course Timetable available on ***info*McGill** via the Web http://www.mcgill.ca/students/courses/.

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

● Denotes courses not offered in 2001-02.

▭ Denotes limited enrolment.

109-200A,B HISTORY OF COMMUNICATIONS I. (3) The social and cultural implications of major developments in communications from pre-history to the start of the electronic age.

109-210A,B HISTORY OF COMMUNICATIONS II. (3) The social and cultural consequences of major developments in mass communications from the onset of the electronic age to the present.

109-521A,B COMMUNICATIONS IN HISTORY. (3) North American communication studies have undergone five discernible changes in the definition and focus of the field. The major "schools" of thought to be covered are the Chicago and Lazarsfeld heritages, the institutionalization of communication science in the academy, and the post-modern period.

109-531A,B FEMINIST COMMUNICATION THEORY. (3) Research seminar on a topic on feminist communication theory.

109-541A,B CULTURAL INDUSTRIES. (3) The convergence of computerized technologies and cultural industries and how these have produced entire new forms of cultural expression in film, TV, and the Internet.

109-611A,B HISTORY/THEORY/TECHNOLOGY. (3) A critical appraisal of current issues in the field of communications notably through an examination of how new theorists have dealt with the effects and consequences of developments in the technologies of communication. The contributions of Canadian media theorists figure significantly in the seminar's concerns.

109-613A,B GENDER AND TECHNOLOGY. (3) Contemporary culture and media in Canada and Quebec since 1945, with special emphasis on the '70s.

▭ **109-616A,617B (109-702D) PRO-SEMINAR IN COMMUNICATIONS.** (6) A required course for all new M.A. and Ph.D. students. The Pro-Seminar is designed to explore theoretical & methodological issues in Communications through a series of presentations by the GPC faculty and other McGill associates.

109-619A,B CULTURAL COMMODITIES. (3) The relationship between current theories of communications, cultural policy and cultural institutions. Analysis of popular culture and its relationship to other cultural artifacts in modern societies.

109-621A,B INTERPERSONAL COMMUNICATION. (3) An examination of communication behavior with a special emphasis placed on the study of interpersonal communication in the mass media, especially advertising and political rhetoric.

109-623A,B INFORMATION DESIGN. (3) Examination of the basic concepts and methodologies in the design of information.

109-625A,B NEW MEDIA POLICY. (3) New media policies in relation to changing communication needs in the context of shifting regulatory demands.

109-629A,B CANADIAN CULTURAL COMMUNICATIONS POLICY. (3) An advanced seminar in history and theory of Canadian cultural and communications policy in the context of rapidly changing technological environments.

109-631A,B DISCOURSE ANALYSIS. (3) Introduction to important trends in traditional, structural, and post-structural theories of discourse analysis.

109-633A,B GENDER AND REPRESENTATION. (3) Research Seminar on a topic on gender.

109-637A,B CULTURAL ANALYSIS IN HISTORY. (3) Further analysis of cultural products, policy, history and the role of cultural institutions in the development of media practices.

109-639A,B INTERPRETIVE METHODS IN MEDIA. (3) A study of the various modes of interpreting and understanding the products of the mass media and of other human communication events.

109-643A,B NARROWCAST MEDIA. (3) Seminar in theories of communications and alternative media.

109-646A,B POPULAR MEDIA. (3) An assessment of popular culture and the research strategies employed; an examination of semiotics, critical theory, literary criticism, psychoanalysis, and cultural studies. Case studies from several of the following areas will be critiqued: fashion, music, advertising sub-cultural codes and behavior, soap operas, visual art and cult films.

109-647A,B COMPUTERS AND THE MEDIA. (3) The practical and theoretical aspects of designing communications media.

109-649A,B AUDIENCE ANALYSIS. (3) Advanced theoretical and empirical work on audience analysis from the perspective of recent research in mass communications.

▭ **109-696A,B RESEARCH PROJECT I.** (6)

▭ **109-697A,B RESEARCH PROJECT II.** (6)

19 Computer Science

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Director — D. Thérien

Chairs of Graduate Program:
M.Sc. – T. Merrett
Ph.D. – G. Toussaint

19.1 Staff

Emeritus Professor
C. Paige; B.Sc., B. Eng.(Sydney), Ph.D.(London, England)

Professors
D. Avis; B.Sc.(Wat.), Ph.D.(Stan.)
L. Devroye; M.S.(Louvain), Ph.D.(Texas)
T.H. Merrett; B.Sc.(Queen's), D.Phil.(Oxon.)
M.M. Newborn; B.E.E.(R.P.I.), Ph.D.(Ohio St.), F.A.C.M.
P. Panangaden; M.Sc.(I.I.T. Kanpur), Ph.D.(Wis.)

G.F.G. Ratzer; B.Sc.(Glas.), M.Sc.(McG.)
D. Therien; B.Sc.(Mont.), Ph.D.(Wat.)
G.T. Toussaint; B.Sc.(Tulsa), Ph.D.(Br.Col.)

Associate Professors
C. Crepeau; B.Sc., M.Sc.(Montr.), Ph.D.(M.I.T.)
G. Dudek; B.Sc.(Queen's), M.Sc., Ph.D.(Tor.)
N. Friedman; B.A.(W.Ont.), Ph.D.(Tor.)
L. Hendren; B.Sc., M.Sc.(Queen's), Ph.D.(Cornell)
N. Madhavji; B.Sc.(Essex), Ph.D.(Man.) *(on leave 2001-02)*
C. Tropper; B.Sc.(McG.), Ph.D.(Brooklyn Poly.)
S. Whitesides; M.S.E.E.(Stan.), Ph.D.(Wis.) *(on leave 2001-02)*

Assistant Professors
D. Bryant; B.Sc., Ph.D.(U. of Canterbury)
X-W. Chang; B.Sc., M.Sc.(Nanjing), Ph.D.(McG.)
K. Driesen; Licentiate, M.A.(Free Brussels), Ph.D.(UC- Santa-Barbara)
M.T. Hallett; B.Sc.(Queens), Ph.D. (Vic. B.C.)
B. Kemme; B.Sc.(U. of Seville), M.Sc. (UC- Santa Barbara), Ph.D.(ETH, Zurich)
M. Langer; B.Sc. (McG.), M.Sc.(UC- Santa Barbara), Ph.D.(McG.)
D. Precup; B.Sc.(Tech. U. of Cluj-Napoca), M.Sc., Ph.D.(Mass, Amherst)
K. Siddiqi; B.Sc.(Lafayette), M.Sc., Ph.D (Brown)
H. Vangheluwe; B.Sc., M.Sc., Ph.D. (Ghent Univ., Belgium)
C. Verbrugge; B.A.(Queen), Ph.D.(McG.)

Adjunct Professors
R. De Mori, K. El Emam, S. Hyder, V. van Dongen

19.2 Programs Offered

Master's in Computer Science (Thesis Option)

Master's in Computer Science (Project Option)

Ph.D. in Computer Science

19.3 Admission Requirements

Master's (M.Sc.)

The minimum requirement for admission is a bachelor's degree (CGPA 3.2 or better, or equivalent) with the course work in Computer Science indicated in the brochure "Information for Applicants to Graduate Programs".

The brochure supplements information in this Calendar and should be consulted by all graduate students.

Ph.D.

Candidates who do not hold a Master's degree from a recognized department of Computer Science will normally first register for the M.Sc.

Candidates with excellent standing in the M.Sc. program may be allowed to proceed to the Ph.D. degree without first submitting a Master's thesis; however, in other cases, permission to proceed to the Ph.D. may depend on the standing obtained in the M.Sc. Exceptional candidates who do not hold a Master's degree in Computer Science are, on rare occasions, admitted directly to the Ph.D. program.

19.4 Application Procedures

Applications will be considered upon receipt of:

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

All information is to be submitted directly to the Graduate Secretary.

Deadline(s): February 1st (if applicant wishes to be considered for scholarship awards); April 1st.

19.5 Program Requirements

Master's

The M.Sc. program has two options, a thesis and a project option. All students are required to take a reading course during their first year. In addition, the thesis option (49 credits) requires six courses and a thesis, and the project option (46 credits) requires nine courses and a project. Courses will be chosen with guidance from an academic adviser, subject to approval by the School.

Ph.D.

Candidates must fulfill the requirements outlined in the general rules of the Faculty. They must successfully complete courses (determined by supervisor), the Ph.D. thesis proposal exam, the comprehensive examination and submit a Ph.D. thesis. There is no language requirement.

19.6 Courses

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

Not every course listed here is offered each year. Precise information about course offerings is available from the School at the beginning of the term.

The names of course instructors are listed on the Course Timetable available on ***info*McGill** via the Web http://www.mcgill.ca/students/courses/.

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

308-505A HIGH-PERFORMANCE COMPUTER ARCHITECTURE. (3) (3 hours) (Prerequisites: 308-302 and 308-305 or equivalent.) Basic principles and techniques in the design of high-performance computer architecture. Topics include memory architecture: cache structure and design, virtual memory structures: pipelined processor architecture: pipeline control and hazard resolution, pipelined memory structures, interrupt, evaluation techniques; vector processing; RISC vs. CISC architecture; general vs. special purpose architectures; VLSI architectures; VLSI architecture issues.

308-506B ADVANCED ANALYSIS OF ALGORITHMS. (3) (3 hours) (Prerequisite: 308-330 or 308-360 or 308-405 or 308-431) The study of computational complexity and intractability: Cook's Theorem, NP-completeness, oracles, the polynomial hierarchy, lower bounds, heuristics, approximation problems.

308-507A COMPUTATIONAL GEOMETRY. (3) (3 hours) (Prerequisite: 308-360 or 308-405 or equivalent or corequisite 308-506) Problems in computational geometry; worst-case complexity of geometric algorithms; expected complexity of geometric algorithms and geometric probability; geometric intersection problems; nearest neighbour searching; point inclusion problems; distance between sets; the diameter and convex hull of a set; polygon decomposition; the Voronoi diagram and other planar graphs; updating and deleting from geometric structures.

308-520A COMPILER DESIGN. (4) (3 hours, 1 hour consultation) (Prerequisites: 308-273 and 308-302) The structure of a compiler. Lexical analysis. Parsing techniques. Syntax directed translation. Run-time implementation of various programming language constructs. Introduction to code generation for an idealized machine. Students will implement parts of a compiler.

308-522A MODELLING AND SIMULATION. (4) (3 hours) (Prerequisites: 308-251, 308-302, 308-350) Simulation and modeling processes, state automata, Petri Nets, state charts, discrete event systems, continous-time models, hybrid models, system dynamics and object-oriented modeling.

308-524B PROGRAMMING LANGUAGE THEORY. (3) (3 hours) (Prerequisite: 308-302 and 189-340 or 189-235) Operational and denotational semantics of programming languages. Equivalence theorems for first-order languages. Lambda calculus. Type-inference, typed lambda calculus. Polymorphism. Elements of domain history and fixed-points induction.

308-525B FORMAL VERIFICATION (3) (3 hours) (Prerequisites: 308-251, 308-310, 308-330 and 189-340) Propositional logic - syntax and semantics, temporal logic, other modal logics, model checking, symbolic model checking, binary decision diagrams, other approaches to formal verification.

308-526 PROBABILISTIC REASONING AND AI (3) (3 hours) (Prerequisites: 308-206, 308-424, 308-360 and 189-323) Belief Networks, Utility Theory, Markov Decision Processes and Learning Algorithms.

308-530A FORMAL LANGUAGES. (3) (3 hours) (Prerequisite: 308-203) The definition of a language. Grammars. Finite automata and regular languages. Context free languages. Pushdown automata. Turing machines and undecidable problems. Context sensitive and phrase-structure languages.

308-531B THEORY OF COMPUTATION. (3) (3 hours) (Prerequisite: 308-330) Models for sequential and parLallel computations: Turing machines, boolean circuits. The equivalence of various models and The Church-Turing thesis. Unsolvable problems. Model dependent measures of computational complexity. Abstract complexity theory. Exponentially and super-exponentially difficult problems. Complete problems.

308-534B TEAM SOFTWARE ENGINEERING. (3) (3 hours) (Prerequisite: 308-433A or equivalent) Team-work and team-processes for evolving software systems. Guided by defined processes, project teams will elicit new requirements, design code and test an enhanced software system. Team members will play various technical and managerial roles in carrying out their software project.

308-535A COMPUTER NETWORKS. (3) (3 hours) (Prerequisite: 308-310) Exposition of the first four layers of the ISO model for computer network protocols, i.e., the physical, data, network, and transport layers. Basic hardware and software issues with examples drawn from existing networks, notably SNA, DECnet and ARPAnet.

308-537B INTERNET PROGRAMMING. (3) (3 hours) (Prerequisites: 308-251and 308-302 and any one of [308-310, 308-420, 308-424, 308-433]) Sockets, User Datagram Protocol (UDP), Transmission utility protocols: remote terminal protocol (Telnet), Simple Mail Transfer Protocol (SMTP), File Transfer Protocol (FTP) Hypertext Transfer Protocol (HTTP). Internet resource database and search engines. Remote File Systems, Distributed objects, Common Object Request Broker Architecture (CORBA).

▭ **308-538B PERSON-MACHINE COMMUNICATION** (3) (3 hours) (Prerequisite: 308-251 or 308-302) Introduction to programming techniques and hardware design concepts that facilitate interaction between humans and computers. Theories and models for person-machine communication, object oriented design and software engineering of interfaces. Natural language facilities.

308-540B MATRIX COMPUTATIONS. (3) (3 hours) (Prerequisite: 189-327 or 308-350) Designing and programming reliable numerical algorithms. Stability of algorithms and condition of problems. Reliable and efficient algorithms for solution of equations, linear least squares problems, the singular value decomposition, the eigenproblem and related problems. Perturbation analysis of problems. Algorithms for structured matrices.

308-547A CRYPTOGRAPHY AND DATA SECURITY. (3) (3 hours) (Prerequisite: 308-360.) (Restriction: Not open to students who have taken 308-647.) This course presents an in-depth study of modern cryptography and data security. The basic information theoretic and computational properties of classical and modern cryptographic systems are presented, followed by a cryptanalytic examination of serveral important systems. We will study the application of cryptography to the security of electronic mail, time-sharing systems, computer networks and databases.

308-557B FUNDAMENTALS OF COMPUTER GRAPHICS. (3) (3 hours) (Prerequisites: 189-223 and 308-251 or 308-302) The study of fundamental mathematical algorithmic and representational issues in computer graphics. The topics to be covered are: overview of graphics process, projective geometry, homogeneous coordinates, projective transformations, quadrics and tensors, line-drawing, surface modelling and object modelling reflectance models and rendering, texture mapping, polyhedral representations, procedural modeling, and animation.

308-558B FUND. OF COMPUTER VISION (3) (3 hours) (Prerequisites: 308-206, 308-360, 189-222, 189-223) (Restriction: not open to students who have taken 308-766 [Shape Analysis in Computer Vision] before January 2001.) Biological vision, edge detection, projective geometry and camera modeling, shape from shading and texture, stereo vision, optical flow, motion analysis, object representation, object recognition, graph theoretic methods, high level vision, applications.

308-560A GRAPH ALGORITHMS AND APPLICATIONS. (3) (3 hours) (Prerequisites: 308-360 or 308-405 or 308-431 or 189-343) Algorithms for connectivity, partitioning, clustering, colouring and matching. Isomorphism testing. Algorithms for special classes of graphs. Layout and embeddings algorithms for graphs and networks.

308-562A COMPUTATIONAL BIOLOGY METHODS. (3) (3 hours) (Prerequisites: 308-330, 308-350, 308-360 and 189-323) Application of computer science techniques to problems arising in biology and medicine, techniques for modeling evolution, aligning molecular sequences, predicting structure of a molecule and other problems from computational biology.

308-566A DISCRETE OPTIMIZATION 1. (3) (3 hours) (Prerequisites: 308-360 or 308-405 and 189-223) Use of computer in solving problems in discrete optimization. Linear programming and extensions. Network simplex method. Applications of linear programming. Vertex enumeration. Geometry of linear programming. Implementation issues and robustness. (Awaiting University approval - course description revision.)

308-567B DISCRETE OPTIMIZATION 2. (3) (3 hours) (Prerequisites: 308-566 or 189-417) Formulation, solution and applications of integer programs. Branch and bound, cutting plane, and column generation algorithms. Combinatorial optimization. Polyhedral methods. A large emphasis will be placed on modeling. Students will select and present a case study of an application of integer programming in an area of their choice.

▭ **308-573A,B MICROCOMPUTERS.** (3) (3 hours) (Prerequisite: 308-305) Characteristics and internal structure of microcomputers and workstations. Architectures of current CISC and RISC microprocessors. Assembler and machine languages for microcomputers. System software. Applications for single and networked microcomputers. Students will be assigned "hands-on" projects.

308-575A FUNDAMENTALS OF DISTRIBUTED ALGORITHMS. (3) (3 hours) (Prerequisite: 308-310) Study of a collection of algorithms basic to the world of concurrent programming. We discuss algorithms from the following areas: termination detection, deadlock detection, global snapshots, clock synchronization, fault tolerance (byzantine and self-stablizing systems).

308-601D,N SPECIAL TOPICS IN COMPUTER SCIENCE. (4) (2 per term) (Restricted to Computer Science students.) Students will report on a specific area of computer science. Topics will be selected to reflect the current research interests of the staff of the School.

308-605B PARALLEL COMPUTER ARCHITECTURE. (4) (3 hours) Basic principles and techniques in parallel computer architecture. Topics include: characteristics of parallel computation models; instruction-level parallelism and architectures; vector architecture; shared memory vs. message-passing architectures; memory models and cache coherence; interconnection techniques and high-speed networks, parallel programming issues; multithreaded architecture; future trends.

308-608B ADVANCED COMPUTATIONAL GEOMETRY. (4) (3 hours) (Prerequisite: 308-507) Advanced topics in computational geometry emphasizing problems in dimensions three and higher. Convex hulls, collision avoidance problems, minimal enclosing boxes, interlocking polyhedra, space partitioning, extremal sections of convex polyhedra, reverse search and enumeration, geometric problems from the manufacturing industry including injection mold-

ing, gravity casting, stereolithography, NC-machining and tolerancing metrology.

308-610A INFORMATION STRUCTURES I. (4) (3 hours) Study of elementary data structures: lists, stacks, queues, trees, hash tables, binary search trees, red-black trees, heaps. Augmenting data structures. Sorting and selection, Recursive algorithms. Advanced data structures including binomial heaps, Fibonacci heaps, disjoint set structures, and splay trees. Amortizing. String algorithms. Huffman trees and suffix trees. Graph algorithms.

308-611B INFORMATION STRUCTURES II. (4) (3 hours) Graphs play an important role in computer science: as data structures, as tools in algorithmic analysis, and as a source of algorithmic problems. This course is an introduction to graph theory for computer scientists via the problem-solving approach. Emphasis on developing oral and written communication skills.

308-612A DATABASE SYSTEMS. (4) (3 hours) Database programming using the relational algebra. Introduces the relational model of databases and high level programming techniques with applications to data processing, text and picture processing, knowledge bases and logic programming on secondary storage.

308-617B INFORMATION SYSTEMS. (4) (3 hours) (Prerequisite: 308-612) Seminar course. A major area of application of the techniques covered in 308-612 is discussed. No prior expertise in the application area is required, since the emphasis of the course is on methods of computation. Storage structures and algorithms for efficient retrieval and processing of data for the application will be discussed.

308-621B OPTIMIZING COMPILERS. (4) (3 hours) (Prerequisite: 308-251 or equivalent, 308-302 or equivalent, 308-520 is useful but not strictly necessary.) This course examines the components of optimizing compiler, tree-like and graph-like intermediate representations, flow analysis, abstract interpretation, program transformation, register allocation, an introduction to instruction scheduling and parallelization techniques. Students complete assignments and a course project.

308-622B COMPILING FOR PARALLEL MACHINES. (4) (3 hours) (Prerequisites: 308-520 and 308-505 or equivalents, suggested prerequisites/corequisites 308-621 and 308-623) This course studies the contemporary work in compiler design and implementation for parallel computer systems such as vector/pipelined machines, superscalar/superpipelined machines, and SIMD/MIMD multiprocessor systems. Compiling issues for novel architectures with fine-grain parallelism.

308-623B CONCURRENT PROGRAMMING LANGUAGES. (4) (3 hours) (Prerequisite: 308-302 or equivalent.) The course will include the following topics: deadlock, fairness, liveness and safety properties, distributed protocols, standard concurrent programming problems, a comparative study of concurrent programming paradigms. Additional topics: dataflow programming, concurrent constraint programming, concurrent logic programming, process algebra, fault tolerant distributed systems, parallel object-oriented languages.

308-627B THEORY OF PROGRAMMING LANGUAGES. (4) (3 hours) (Prerequisites: 308-524 and 308-530) Programming language semantics. Lambda calculus, the Church Rosser theorem, typed lambda calculus, the strong normalization theorem, polymorphism, type inference, elements of domain theory, models of the lambda calculus, relating operational and denotational semantics, full abstraction. Reasoning about programs. Soundness and relative completeness of program logics.

308-630A SOFTWARE DEVELOPMENT ENVIRONMENT TECHNIQUES. (4) (3 hours) (Prerequisite: 308-434) The course aims to teach the main features of, and the techniques to construct, Software Development Environments (SDEs). Students would benefit from this course by obtaining an understanding of the practical problems in large scale software development projects, and how formal and practical approaches may be put to use in solving these problems.

308-631A SOFTWARE PROCESS ENGINEERING. (4) (3 hours) (Prerequisite: 308-434) Software is critical; the record is poor, and improvement action is needed. The quality of a software system is governed by the quality of the process used to develop and maintain it. The course aims to describe the technical and managerial topics critical in the design, engineering and management of software processes.

308-644B PATTERN RECOGNITION. (4) (3 hours) Techniques for smoothing, approximating and enhancing spatial and temporal data. Feature extraction and shape measurement using spatial moments and medial axis transforms. Detecting structure using Hough transforms and proximity graphs. Discriminant functions. Neural networks. Bayesian decision theory. Feature selection. Estimation of misclassification. Nearest neighbor decision rules. Applications.

308-646A COMPUTATIONAL PERCEPTION. (4) (3 hours) Seminar course on perception problems from a computer science perspective. Vision problems such as stereo, shading, motion, color, object recognition. Audition problems such as sonar, source localization, source recognition.

308-647B ADVANCED CRYPTOGRAPHY (4) (3 hours) (Prerequisite: 308-547).Information theoretic definitions of security, zero-knowledge protocols, secure function evaluation protocols, cryptographic primitives, privacy amplification, error correction, quantum cryptography, quantum cryptanalysis.

308-648B MOTION PLANNING AND ROBOTICS. (4) (3 hours) (Given in alternate years.) Topics in motion planning, including: algorithms and complexity results for collision avoidance; the configuration space approach; the algebraic cell decomposition approach; motion planning using Voronoi diagrams; object representation schemes.

308-650B ANALYSIS OF COMINBATORIAL ALGORITHMS. (4) (3 hours) Design, implementation and analysis of efficient conbinatorial algorithms for computing shortest paths, network flows, minimum cost network flows, spanning trees and matching in graphs. Applications to reliability of networks, critical path, transhipment, vehicle routing and machine sequencing problems. Efficient use of data structures to reduce running time.

308-675A PARALLEL SEARCH PROBLEMS. (4) (3 hours) A study of recent work in parallel search techniques. Algorithms to be considered are: parallel branch and bound, parallel minimax and parallel resolution techniques for theorem proving. Students will be expected to write programs implementing algorithms for parallel search on the School's 32-processor BBN parallel computer.

308-690A PROBABILISTIC ANALYSIS OF ALGORITHMS. (4) (3 hours) Probabilistic analysis of algorithms and data structures under random input. Expected behavior of search trees, tries, heaps, bucket structures and multidimensional data structures. Random sampling, divide-and-conquer, grid methods. Applications in computational geometry and in game tree searching. Combinatorial search problems. Algorithms on random graphs.

308-694A,B,C RESEARCH PROJECT 1. (6) (Restricted to Computer Science students.) Ongoing research pertaining to project.

308-695A,B,C RESEARCH PROJECT 2. (6) (Restricted to Computer Science students.) Ongoing research pertaining to project.

308-698A,B,C THESIS RESEARCH 1. (9) (Restricted to Computer Science students.) Ongoing research pertaining thesis.

308-699A,B,C THESIS RESEARCH 2. (15) (Restricted to Computer Science students.) Ongoing research pertaining to thesis.

308-700A PH.D. COMPREHENSIVE EXAMINATION. (4)

308-701A,B SUMMER THESIS PROPOSAL AND AREA EXAMINATION. (4)

308-760A ADVANCED TOPICS: THEORY 1. (4)

308-761B ADVANCED TOPICS: THEORY 2. (4)

308-762A ADVANCED TOPICS: PROGRAMMING 1. (4)

308-763B ADVANCED TOPICS: PROGRAMMING 2. (4)

308-764A ADVANCED TOPICS: SYSTEMS 1. (4)

308-765B ADVANCED TOPICS: SYSTEMS 2. (4)

308-766A ADVANCED TOPICS: APPLICATIONS 1. (4)

308-767B ADVANCED TOPICS: APPLICATIONS 2. (4)

20 Dentistry

Department of Dentistry
Faculty of Dentistry
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Dean, Faculty of Dentistry — J.P. Lund

Associate Dean, research — M.D. McKee

Director, Graduate Studies — J.S. Feine

Director, Graduate Program in Oral and Maxillofacial Surgery — T.W. Head

20.1 Staff

Professors
M.C. Bushnell; B.A.(Maryland), M.A., Ph.D.(American U.)
J.S. Feine; D.D.S., M.S.(Texas), H.D.R.
J.P. Lund; B.D.S.(Adel.), Ph.D.(W.Ont.)
C.E. Smith; D.D.S., Ph.D.(McG.)

Associate Professors
G. Bennet; B.A.(Rutgers), M.A., Ph.D.(Virginia)
P.J. Chauvin; B.Sc.,D.D.S.(McG.), M.Sc.(W.Ont.), F.A.A.O.P., F.R.C.D.(C)
M. Dagenais; D.M.D.(Montr.), Dip. Oral Radiology(Tor.)
T.W. Head; B.Sc.(Sir G. Wms.), D.D.S., M.Sc.(McG.), F.R.C.D.(C), Dipl. A.B.O.M.S.
M.D. McKee; Ph.D.(McG.)
S. Schwartz; D.M.D.(Montr.), M.Sc. Cert. Pedo.(Boston), F.I.C.D., F.A.C.D.
E.D. Shields; B.Sc.(Ball State), D.D.S., Ph.D.(Ind.)

Assistant Professors
P.J. Allison; B.D.S., F.D.S.R.C.S.,M.Sc.(London), Ph.D.(McG.)
J.R. Emery; D.D.S., M.Sc.(McG.), F.R.C.D.(C), Dipl. A.B.O.M.S.
E.P. Klemetti; D.D.S.(Helsinki), Ph.D.(Kuopio, Finland)
Hervé Lemoual; D.E.A., M.Sc.(Paris), Ph.D.(Montr.)
Jean-Marc Retrouvey; D.M.D.(Montr.), M.Sc.(Boston)

Adjunct Professors
A. Charbonneau; D.M.D., M.Sc., Ph.D.(Montr.)
S. Marchand; (UQAT), M.Sc.(UQTR), Ph.D.(Montr.)
D.J. Ostry; B.A.Sc., M.A.Sc., Ph.D.(Tor.)

Associate Members
E.L. Franco; B.Sc.(Estadual de Campinas), M.P.H., Dr.P.H.(Chapel Hill)
E.G. Gisel; B.S.(Zurich), B.S., M.S., Ph.D.(Temple)
H. Warshawsky; B.Sc.(Sir G.Wms.), M.Sc., Ph.D.(McG.)

20.2 Programs Offered

M.Sc. in Dental Sciences

The goal of this program is to train students in research in the dental sciences which comprise a number of disciplines relating to the functioning of the oro-facial complex.

Please consult the Graduate Secretary, Department of Oral Biology, for further details.

M.Sc. in Oral and Maxillofacial Surgery

A residency training program in Oral and Maxillofacial Surgery provides a candidate with a comprehensive background for the practice of Oral and Maxillofacial Surgery as a specialty.

During the four years of the program the candidate serves as a resident principally at the Montreal General Hospital. During this time the resident is given increasing responsibility for the care of in-patients and out-patients, as well as being required to fulfill certain basic science courses and other assignments. A research project must be undertaken, followed by a Master's thesis.

The program is open to one candidate per year.

20.3 Admission Requirements

M.Sc. in Dental Sciences

Students who have successfully completed the D.D.S./D.M.D. degree or a B.Sc. degree with a CGPA of 3.0 on 4.0 in any of the disciplines in the Health Sciences (Anatomy, Biochemistry, Microbiology and Immunology, Physiology) or related disciplines (Biology, Chemistry, Physics, Psychology) are eligible to apply for admission to a graduate program in the Faculty of Dentistry leading to the M.Sc. degree in Dental Sciences. In addition to submitting GRE scores, TOEFL tests must be passed in the case of non-Canadians whose mother tongue is not English.

The number of candidates accepted each year will depend on the elective courses and research facilities available which are applicable to the candidate's area of expertise.

M.Sc. in Oral and Maxillofacial Surgery

Candidates for this program must possess a D.D.S. or D.M.D. degree or its equivalent, and be acceptable to l'Ordre des Dentistes du Québec as a training candidate in a hospital.

20.4 Application Procedures

M.Sc. in Dental Sciences

All applications must include an up-to-date official transcript of academic performance, two letters of recommendation and a brief resume indicating their particular field of interest for the M.Sc. degree. B.Sc. students who have not obtained eligible qualifications will be required to make up for deficiencies in their academic profile by taking a qualifying year.

Students must be accepted by a research director before the Faculty approves the application, prior to final acceptance by the Faculty of Graduate Studies and Research.

Deadline for receipt of the completed application is December 30 for Fall and September 1 for Winter.

Applications may be obtained by writing to the Graduate Program in Dental Sciences, Faculty of Dentistry, McGill University, 3640 University Street, Montreal, QC H3A 2B2.

M.Sc. in Oral and Maxillofacial Surgery

Applications must be submitted by September 15.

Information for financial support for this program may be obtained by writing to Dr. T.W. Head, Director of the program.

Further information may be obtained by writing to Graduate Program in Oral and Maxillofacial Surgery, Faculty of Dentistry, McGill University, 3640 University Street, Montreal, QC H3A 2B2.

20.5 Program Requirements

All students who are registered in Graduate Clinical Programs in the Faculty of Dentistry, McGill University, and who are not already registered with l'Ordre, must register with l'Ordre des Dentistes du Québec. Further information may be obtained from the Registrar of l'Ordre des Dentistes du Québec, 625 René-Lévesque Boulevard West, Fifteenth Floor, Montreal, QC H3B 1R2.

M.SC. IN DENTAL SCIENCES

The M.Sc. degree should normally be completed within 2 years of full-time study.

Required Courses (8 credits)
513-607A (4) Inferential Statistics (or equivalent course)
4 credits, one graduate seminar
590-671D (4) Graduate Seminars in Dental Sciences
590-771D (4) Graduate Seminars in Dental Sciences

Suggested Complementary Courses (8 – 14 credits)
590-562B (3) Calcified Tissues
590-654B (3) Mechanisms and Management of Pain
504-632D (6) Experimental Morphology

504-663D (9) Histology
177-524B (3) Topics in Molecular Biology of the Gene

Other complementary courses in the University may be taken with the approval of the supervisor or research director.

Thesis Research Courses (24 – 30 credits)
The required number of Master's thesis credits (minimum 24) will be made up from among the following:

590-650A,B,C (3) Thesis Research Course I
590-651A,B,C (6) Thesis Research Course II
590-652B,C, D,E,G (9) Thesis Research Course III
590-653A,B,D,K (15) Thesis Research Course IV

M.SC. IN ORAL AND MAXILLOFACIAL SURGERY
(Revisions to this program are awaiting University approval.)

Duration: Four calendar years commencing July 1. Students will register in the four-year graduate-training program, which leads to a McGill Certificate of Residency Training. They will concurrently register with the Faculty of Graduate Studies and Research during the Third and Fourth years of the program and complete the requirements for the M.Sc. degree during these two years.

20.6 Courses for the M.Sc. in Dental Sciences

590-671D GRADUATE SEMINARS IN DENTAL SCIENCES. (4) One advanced research seminar every week over the fall and winter terms given by invited local and out-of-town speakers on their current research in Oral Biology.

590-562B CALCIFIED TISSUES. (3) (3 hours of lecture supplemented by 1 hour laboratory or conferences) An advanced course on the morphology and cell biology of calcified tissues. This course provides a problem-oriented analysis of research on the structure and mechanism of formation of connective tissue, cartilage and bone, but with particular emphasis on the tissues of the tooth.

590-650A,B,C THESIS RESEARCH I. (3) Independent work under the direction of a supervisor on a research problem in the student's designated area of research.

590-651A,B,C THESIS RESEARCH II. (6) Independent work under the direction of a supervisor on a research problem in the student's designated area of research.

590-652B,C,D,E,G THESIS RESEARCH III. (9) Independent work under the direction of a supervisor on a research problem in the student's designated area of research.

590-653A,B,D,K THESIS RESEARCH IV. (15) Independent work under the direction of a supervisor on a research problem in the student's designated area of research.

590-654B MECHANISMS AND MANAGEMENT OF PAIN. (3) Presentation of the neurobiology of pain and analgesia, clinical pain conditions, basic and applied research methods in the study of pain, and the theory and practice of pain management. The course is designed for graduate students interested in pain mechanisms and clinical residents interested in pain management.

590-771D GRADUATE SEMINARS IN DENTAL SCIENCES. (4) One advanced research seminar every week over the fall and winter terms given by invited local and out-of-town speakers on their current research in Oral Biology.

21 Developing Area Studies

Centre for Developing Area Studies
3715 Peel Street
Montreal, QC H3A 1X1
Canada

Telephone: (514) 398-3507
Fax: (514) 398-8432
Email: cdasadm@leacock.lan.mcgill.ca
Website: http://www.mcgill.ca/cdas

Director — R.E. Boyd, Ph.D.

Documentalist — Iain Blair
Email: cdasdoc@leacock.lan.mcgill.ca

The Centre focuses on research concerning social and economic problems within countries in Africa, Asia, the Caribbean, Latin America and the Middle East, using an interdisciplinary framework. It organizes seminars and conferences on development issues and globalization, primarily in the social sciences.

The Centre has a specialized documentation room, open to the public. In addition, it maintains an active publications program centred around the internationally respected journal *Labour, Capital and Society* and has research fellows and research groups in residence.

The Centre works with an international community of scholars, development groups and the public, and is currently involved in a series of research and development projects focusing on gender, environment, the labouring poor, human security, and globalization.

Graduate students with an interest in international development can apply to become fellows.

22 Dietetics and Human Nutrition

School of Dietetics and Human Nutrition
Room MS2-039, Macdonald-Stewart Building
Macdonald Campus, McGill University
21,111 Lakeshore Road
Sainte-Anne de Bellevue, Q CH9X 3V9
Canada

Telephone: (514) 398-7762
Fax: (514) 398-7739
Email: grant@macdonald.mcgill.ca
Website: http://www.agrenv.mcgill.ca/dietetic

Director — Katherine Gray-Donald

22.1 Staff

Emeritus Professor
Helen Neilson; B.H.S., M.Sc.(McG.)

Professors
Peter J.H. Jones; B.Sc., M.Sc.(Br.Col.), Ph.D.(Tor.)
Harriet V. Kühnlein; B.S.(Penn. St.), M.S.(Oregon St.), Ph.D.(Calif.) *(joint appt. with Faculty of Medicine)*

Associate Professors
Laurie H.M. Chan; B.Sc., M.Sc.(Hong Kong), Ph.D.(Lond.) *(joint appt. with Natural Resource Sciences, and Food Science and Agricultural Chemistry)*
Katherine Gray-Donald; B.Sc., Ph.D.(McG.) *(joint appt. with Epidemiology and Biostatistics, Faculty of Medicine)*
Tim A. Johns; B.Sc.(McM.), M.Sc.(Br.Col.), Ph.D.(Mich.) *(joint appt. with Plant Science)*
Kristine G. Koski; B.S., M.S.(Wash.), Ph.D.(Calif.) *(joint appt. with McGill Nutrition and Food Science Centre, and Division of Experimental Medicine, Faculty of Medicine)*
Stan Kubow; B.Sc.(McG.), M.Sc.(Tor.), Ph.D.(Guelph)
Louise Thibault; B.Sc., M.Sc., Ph.D.(Laval)

Assistant Professors
David J. Bissonnette; B.Sc.(McG.), Ph.D.(Tor.)
Linda J. Wykes; B.Sc., M.Sc., Ph.D.(Tor.)

Faculty Lecturer
Linda Jacobs Starkey; B.Sc.(Mt. St. Vincent), M.Sc., Ph.D.(McG.) *(University Coordinator, Professional Practice (Stage) in Dietetics)*

Cross-Appointed Professors
Franco Carli (Anaesthesia); Katherine Cianflone (Medicine); L. John Hoffer (Medicine); Errol B. Marliss (Medicine); Marilyn E. Scott (Parasitology); Simon N. Young (Psychiatry)

Associate Members
Louis Beaumier (Medicine); Selim Kermasha (Food Sc./ Agr. Chem.); Rejeanne Gougeon (Medicine); Jean-François Yale (Medicine)

Adjunct Professors
Kevin A. Cockell (Health Canada), Jeffrey S. Cohn (Clinical Research Inst. of Canada), Shi-Hsiang Shen (National Research Council Canada)

22.2 Programs Offered

M.Sc., M.Sc. Applied and Ph.D. in Human Nutrition.

Candidates may conduct research in areas of nutritional biochemistry, clinical nutrition, community or international nutrition. In addition, eligible candidates may complete the equivalent of a Dietetic Internship for membership in the professional association for registration as Dietitians and Nutritionists in Canada.

The M.Sc. and Ph.D. programs are research degrees wherein students may conduct research with one of the faculty members. Most areas of research in Human Nutrition are covered in the School and students may wish to work in the areas of basic or applied research. Prospective students are encouraged to contact faculty members to discuss potential research areas since final acceptance requires identification of a research supervisor.

The M.Sc. Applied is intended to provide advanced learning in Nutrition with substantial course work and either a *practicum in the field of Dietetics* or a *project in the area of Human Nutrition.* Students need not define their research area prior to enrolment.

Research Facilities: Students may conduct research at the School of Dietetics and Human Nutrition, including the Mary Emily Clinical Nutrition Research Unit, the Centre for Indigenous Peoples' Nutrition and Environment (CINE), or at the McGill University Health Centre.

22.3 Admission Requirements

M.Sc.

Applicants must be graduates of a university of recognized reputation and hold a B.Sc. degree equivalent to a McGill Honours degree in a subject closely related to the one selected for graduate work. Applicants must have at least a cumulative grade point average (CGPA) in McGill University's credit equivalency of 3.2/4.0 during the last four full-time semesters of a completed Bachelor's degree program in nutrition or a closely related field.

Students with limitations in their academic background may be admitted into a qualifying program for a maximum of two semesters if they have met the School's minimum CGPA of 3.2 of 4.0. **Successful completion of a qualifying program does not guarantee admission to a degree program.**

M.Sc. (Applied)

Applicants to the M.Sc. Applied project or practicum options must have a B.Sc.(Nutritional Sciences) or equivalent with a GPA of 3.2 or higher. The program is available to students who do not have a working knowledge of French, however, not all project or practicum opportunities will be open to them.

Project: All eligible candidates may select the project option. The project option may also serve as a route to dietetics credentialing for some candidates, however, completion of specific undergradute dietetics course work and practica, with the M.Sc. (Applied) project option, will increase the duration and cost of the program.

Practicum: Applicants who have completed a dietetic internship and six months' work experience are eligible for the practicum option.

Ph.D.

Admission for Ph.D. studies normally requires a M.Sc. degree in an area related to the chosen field of specialization.

22.4 Application Procedures

Applications for admission and all supporting documents must be sent directly to:

Student Affairs Office (Graduate Studies)
Macdonald Campus of McGill University
21,111 Lakeshore
Sainte-Anne de Bellevue, Q CH9X 3V9
Canada

Telephone: (514) 398-7925
Fax: (514) 398-7968
Email: grad@macdonald.mcgill.ca

Applications will be considered upon receipt of a signed and completed application form, $60 application fee, current resumé, statement describing reasons for interest in the program and career goals, all official transcripts, two signed original letters of reference on official letterhead of originating institution, and (if required) proof of competency in oral and written English by appropriate exams.

Deadlines – For **international students**, complete applications with supporting documents must reach the Student Affairs Office (Graduate Studies) at Macdonald Campus at least **eight months** prior to the intended start of program. May 1 for January (winter); September 1 for May (summer); January 1 for September (fall). For **domestic students**, it is recommended that complete applications with supporting documents reach the Office at least **six months** (but definitely no later than **three full months)** in advance of the intended start of program – July 1 for January (winter), November 1 for summer, March 1 for September (fall).

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

1. **Certified** personal cheque in Cdn.$ drawn on a Canadian bank;
2. **Certified** personal cheque in U.S.$ drawn on a U.S. bank;
3. Canadian Money order in Cdn.$;
4. U.S. Money Order in U.S.$;
5. Bank draft in Cdn.$ drawn on a Canadian bank;
6. Bank draft in U.S.$ drawn on a U.S. bank, negotiable in Canada;
7. Credit card (by completing the appropriate section of the application form).

Transcripts – Two official copies of all transcripts are required for admission. Transcripts written in a language other than English or French must be accompanied by a certified translation. An explanation of the grading system used by the applicant's university is essential. It is the applicant's responsibility to arrange for transcripts to be sent. DOCUMENTS SUBMITTED WILL NOT BE RETURNED.

It is desirable to submit a list of the titles of courses taken in the major subject, since transcripts often give code numbers only. Applicants must be graduates of a university of recognized reputation and hold a Bachelor's degree equivalent to a McGill Honours degree in a subject closely related to the one selected for graduate work.

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

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

Competency in English – Non-Canadian applicants whose mother tongue is not English and who have not completed an undergraduate degree using the English language are required to submit documented proof of competency in oral and written

English, by appropriate exams, e.g. TOEFL (minimum score 560 on the paper-based test, 220 on the computer-based) or IELTS (minimum overall band 6.5). The MCHE is not considered equivalent. The School reserves the right to request TOEFL results. Please contact the School for details. Results must be submitted as part of the application. The University code is 0935 (McGill University, Montreal); department code is 31 (graduate schools), Biological Sciences - Agriculture.

Graduate Record Exam (GRE) – The GRE is required for all applicants to the School of Dietetics and Human Nutrition who are submitting non-Canadian and non-U.S. transcripts.

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

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

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

22.5 Program Requirements

M.Sc.

Program requirements for the M.Sc. include a minimum of 45 credits. This is comprised of 31 credits for the thesis (382-680, 681, 682, 683), two credits of required seminars (382-695, 696), and four three-credit graduate courses. The student may be advised to take more than four courses.

M.Sc. Applied

Program requirements for the M.Sc. Applied include a minimum of 45 credits. This is comprised of 29 course credits (nine three-credit courses and two credits of required seminars (382-695, 696), and 16 credits of project or practicum courses.

Ph.D.

Requirements for the Ph.D. include a course of study recommended by the committee including a comprehensive examination (382-701), a research dissertation, and possibly two credits of required seminars (382-797, 798). Course work at the Ph.D. level normally comprises a smaller portion than for the M.Sc. degree. The research program must clearly show originality and be a contribution to knowledge. At least three years are required to meet the Ph.D. requirements. Outstanding students may be permitted to transfer to the Ph.D. program following the first year of M.Sc. study.

22.6 Courses

The names of course instructors are listed on the Course Timetable available on ***info*McGill** via the Web http://www.mcgill.ca/students/courses/.

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

● Denotes courses not offered in 2001-02.

★ Denotes courses offered only in alternate years.

Some courses are given every second year.

● ★ **382-501A NUTRITION IN DEVELOPING COUNTRIES.** (3) (2 lectures and 1 seminar) (Prerequisite: Consent of instructor.)

★ **382-511B NUTRITION AND BEHAVIOUR.** (3) (2 lectures and 1 seminar) (Prerequisite: 382-445A for undergraduate students or consent of instructor.) Discussion of knowledge in the area of nutrition and behaviour through lectures and critical review of recent literature; to discuss the theories and controversies associated with relevant topics; to understand the limitations of our knowledge. Topics such as diet and brain biochemistry, stress, feeding behaviour and affective disorders will be included.

382-512A,B HERBS, FOODS AND PHYTOCHEMICALS. (3) (3 lectures) (Prerequisite: Biochemistry I and permission of instructor.) An overview of the use of herbal medicines and food phytochemicals and the benefits and risks of their consumption. The physiological basis for activity and assessment of toxicity will be presented. Current practices relating to the regulation, commercialization and promotion of herbs and phytochemicals will be considered.

★ **382-600A,B ADVANCED CLINICAL NUTRITION I.** (3) (3 lectures) (Prerequisites: Courses in human nutrition, biochemistry and physiology and permission of instructor.) Application of nutrition knowledge in the therapy and support of humans in various physiological and pathological states. The etiology, biochemistry and pathology of various medical disorders; their nutritional assessment and treatment

★ **382-601A,B ADVANCED CLINICAL NUTRITION II.** (3) (3 lectures) (Prerequisites: 382-377B, 382-344B, 382-445A or equivalent and permission of instructor.) Application of advanced clinical nutrition knowledge in the therapy and support of humans in various physiological and pathological states. The etiology, biochemistry and pathology of various medical disorders not included in 382-600A; their nutritional assessment and treatment.

● ★ **382-602A,B ADVANCED NUTRITIONAL STATUS ASSESSMENT.** (3) (1 lecture and 1 lab) (Prerequisites: courses in human nutrition, biochemistry and physiology.)

● ★ **382-603A,B NUTRITIONAL TOXICOLOGY.** (3) (Prerequisites: courses in human nutrition, biochemistry and physiology.)

● ★ **382-604B INTEGRATED METABOLIC RESEARCH.** (3) (2 seminars and 1 lab visit) (Prerequisites: at least one 500 or 600-level course in nutritional biochemistry, e.g. 342-551B, 342-552B, 342-634B, and permission of instructor.)

382-606A,B RESEARCH METHODS IN HUMAN NUTRITION. (3) (3 lectures) (Prerequisites: A graduate course in statistics or permission of the instructor.) Basic approaches, philosophy and techniques used in nutrition research with human population groups. The course will include the formation and criticism of designs for research, sampling techniques, measurement and analysis issues and human research ethics.

382-608A,B SPECIAL TOPICS I. (3) (Prerequisite: permission of instructor and Director of School. Restricted to graduate students in Nutrition.) Prescribed reading, conference, lectures, assignments and/or practical work on selected topics in student's area of specialization. An approved course outline must be on file in the School's office prior to registration.

382-609A,B SPECIAL TOPICS II. (3) (Prerequisite: permission of instructor and Director of School. Restricted to graduate students in Nutrition.) An individualized course to allow students to undertake projects in library, laboratory, or field study. An approved course outline must be on file in the School's office prior to registration.

★ **382-610B MATERNAL AND CHILD NUTRITION.** (3) Advanced discussion of the scientific basis for nutrient requirements during pregnancy, lactation, and infant nutrition in humans and comparative animal species; milk and formula composition; malnutrition and supplemental feeding programs in developed and developing countries; nutrient requirements and controversial issues in childhood and adolescent nutrition.

★ **382-620A NUTRITION OF INDIGENOUS PEOPLES.** (3) (Prerequisite: One course in nutritional sciences.) In-depth study of nutritional and environmental issues related to indigenous people in

Canada and elsewhere. Changing patterns of food use; health related to diet; systems of traditional and market food; techniques and ethics of nutritional and environmental research with indigenous peoples.

382-651A,B,C M.Sc. (APPLIED) NUTRITION I. (3) (Corequisites: 382-606, 382-695) Review of literature and problem definition for both the project option or for placement preparation for practicum option. This course relates to the Human Nutrition M.Sc. (Applied) degree and is required for both project and practicum options.

382-652A,B,C M.Sc. (APPLIED) PROJECT I. (3) (Prerequisite: 382-651) Project design and planning.

382-653A,B,C M.Sc. (APPLIED) PROJECT II. (3) (Prerequisite: 382-652) Project execution. This project relates to the Human Nutrition M.Sc. (Applied) degree.

382-654A,B,C M.Sc. (APPLIED) PROJECT III. (3) (Prerequisite: 382-653) Continuation of project execution and data collection; preliminary analysis. This project relates to the Human Nutrition M.Sc. (Applied) degree.

382-655A,B,C M.Sc. (APPLIED) PROJECT IV. (3) (Prerequisite: 382-654) Data analysis. Submission of project report. This project relates to the Human Nutrition M.Sc. (Applied) degree.

382-656A,B,C M.Sc. (APPLIED) PRACTICUM I. (3) (Prerequisite: 382-651) Clinical or community placement (4 weeks). Submission of placement report. This practicum relates to the Human Nutrition M.Sc. (Applied) degree.

382-657A,B,C M.Sc. (APPLIED) PRACTICUM II. (3) (Prerequisites: 382-656) Continuation of placement (4 weeks). Submission of placement report. This practicum relates to the Human Nutrition M.Sc. (Applied) degree.

382-658A,B,C M.Sc. (APPLIED) PRACTICUM III. (3) (Prerequisite: 382-657) Continuation of placement (4 weeks). Submission of placement report. This practicum relates to the Human Nutrition M.Sc. (Applied) degree.

382-659A,B,C M.Sc. (APPLIED) PRACTICUM IV. (3) (Prerequisites: 382-658) Continuation of placement (4 weeks). Submission of placement report. This practicum relates to the Human Nutrition M.Sc. (Applied) degree.

382-660A,B,C M.Sc. (APPLIED) NUTRITION II. (1) (Prerequisites: 382-653; 382-659 or 382-655) Oral presentation. This presentation relates to the Human Nutritio\n M.Sc. (Applied) degree, project and practicum options.

382-680A,B,D,N HUMAN NUTRITION M.Sc. THESIS I. (6) Independent research under the direction of a supervisor toward completion of the M.Sc. thesis.

382-681A,B,D,N HUMAN NUTRITION M.Sc. THESIS II. (6) Independent research under the direction of a supervisor toward completion of the M.Sc. thesis. Presentation of a thesis proposal.

382-682A,B,D,N HUMAN NUTRITION M.Sc. THESIS III. (9) Independent research under the direction of a supervisor toward completion of the M.Sc. thesis.

382-683A,B,D,N HUMAN NUTRITION M.Sc. THESIS IV. (10) Final submission, thesis defense seminar and approval of the M.Sc. thesis.

382-695A,B HUMAN NUTRITION SEMINAR I. (1) Students will present a recent original research article in which the methods and data presentation will be critically analyzed. The article must be approved by the instructor.

382-696A,B HUMAN NUTRITION SEMINAR II. (1) Students will present a recent original research article in which the methods and data presentation will be critically analyzed. The article must be approved by the instructor.

382-701A,B DOCTORAL COMPREHENSIVE EXAMINATION. (See Faculty Regulations)

382-797A,B HUMAN NUTRITION SEMINAR III. (1) Doctoral candidates will present a recent original research article in which the methods and data presentation will be critically analyzed. The article must be approved by the instructor.

382-798A,B HUMAN NUTRITION SEMINAR IV. (1) Doctoral candidates will present a group of recent research articles in which the methods and data presentation will be critically analyzed. The articles must be approved by the instructor.

Students may also take courses in other faculties such as Medicine or Education.

23 Earth and Planetary Sciences

Department of Earth and Planetary Sciences
Frank Dawson Adams Building
3450 University Street
Montreal, QC H3A 2A7
Canada

Telephone: (514) 398-6767
Fax: (514) 398-4680
Email: carol@eps.mcgill.ca
Website: http://www.eps.mcgill.ca

Chair — Alfonso Mucci

23.1 Staff

Emeritus Professors
E.W. Mountjoy; B.A.Sc.(Br.Col.), Ph.D.(Tor.)
W.H. MacLean; B.Geol.Eng.(Colo. Sch. of Mines), M.Sc.(A), Ph.D.(McG.)
C.W. Stearn; B.Sc.(McM.), M.S., Ph.D.(Yale), F.R.S.C.

Professors
J. Arkani-Hamed; B.Eng.(Tehran), Ph.D.(M.I.T.)
D. Francis; B.Sc.(McG.), M.Sc.(Br.Col.), Ph.D.(M.I.T.)
A.J. Hynes; B.Sc.(Tor.), Ph.D.(Cantab.)
O.G. Jensen; B.Sc., M.Sc., Ph.D.(Br.Col.)
R.F. Martin; B.Sc.(Ott.), M.S.(Penn. St.), Ph.D.(Stan.)
A. Mucci; B.Sc., M.Sc.(Montr.), Ph.D.(Miami)
A.E. Williams-Jones; B.Sc., M.Sc.(Natal), Ph.D.(Queen's)

Associate Professors
D. Baker; B.A.(Chic.), Ph.D.(Penn. St.)
J. Paquette; B.Sc., M.Sc.(McG.), Ph.D.(Stonybrook)
J. Stix; A.B.(Dart.), M.Sc., Ph.D.(Tor.)
H. Vali (Director, Electron Microscopy Centre)

Assistant Professor
B. Hart; B.A.(McM.), M.Sc.(UQAR), PhD.(W.Ont.)

Lecturer
S.T. Ahmedali

Associate Members
M. Bilodeau (Mining Engineering)
B. Volesky (Chemical Engineering)

Research Associate
P. Lorrain

23.2 Programs Offered

Opportunities for advanced study and research in geology, geochemistry, geophysics, planetary sciences and oceanography are available to qualified students. Graduate programs leading to the M.Sc., and Ph.D. degrees are offered.

Financial assistance is available in the form of demonstratorships, research assistantships and scholarships.

AREAS OF RESEARCH

Economic Geology
Stratigraphy and geochemistry of massive sulfide deposits, alteration systems, mass changes, wallrock stratigraphy; application of fluid inclusions, isotopic, theoretical, and experimental studies of the genesis of granitoid-related Sn-W-Mo-rare metal and epithermal Au-Ag deposits.

Environmental Geology and Low Temperature Geochemistry
Low-temperature geochemistry and chemical oceanography; chemical thermodynamics and kinetics of solid solution reactions in natural environments; early diagenesis of marine, coastal, and estuarine sediments; crystal growth mechanisms in low-temperature aqueous solutions and their influence on element partitioning in minerals.

Geochronology
U-Pb geochronology, Sr and Nd isotopic tracing, seismic risk assessment (paleoseismology).

Igneous Petrology
Origin and evolution of basic magmas in the mantles of the terrestrial planets; non-orogenic magmatism, alkali feldspars as indicators of magmatic and post-magmatic processes; high-temperature geochemistry, experimental investigation of petrogenetic processes, structure and properties of silicate melts and glasses, physical and chemical controls on volcanic eruptions.

Planetary Sciences
Geophysical potential fields, dynamics of planetary interiors; global geodynamics and physics of Earth's interior; seismology – tectonophysics, geophysical systems analysis.

Sedimentary Geology
Sedimentology of modern and ancient continental margins (clastic sediments, diagenesis, marine geology and plate tectonics); sedimentation and diagenesis, ancient and modern carbonates, Cordilleran structure and stratigraphy.

Tectonics
Tectonics and structural geology, transpression in the Canadian Cordillera, origin of the Hudson Bay Arc, gravity features of sutures in the Canadian Shield, uplift of the Laurentides, paleomagnetism and plate motions.

23.3 Admission Requirements

Applicants should have an academic background equivalent to that of a McGill graduate in the Honours or Major program in geology, geophysics, chemistry, or physics (3.0 out of 4.0). The admissions committee may modify the requirements in keeping with the field of graduate study proposed. In some cases a qualifying year may be required.

23.4 Application Procedures

Applications and all supporting documents should be received in the Department before May 1st for admission the following September. Applicants requiring financial assistance should apply as early as possible. There are no special forms required to apply for financial aid from the Department, as all applicants will be considered for the awards for which they are eligible.

Candidates should indicate their field(s) of interest when making formal application for admission. Specific inquiries concerning the Department should be addressed to Graduate Admissions, Department of Earth and Planetary Sciences.

23.5 Program Requirements

M.Sc. Degree (45 credits)
The M.Sc. degree program includes:

a) 12 credits from formal graduate courses to be chosen with the approval of the research director and Director of Graduate Studies and

b) a thesis (33 credits) to be submitted according to the rules of the Faculty and the Department.

Ph.D. Degree
The Ph.D. degree program comprises:

a) an approved program of courses selected in consultation with the student's academic adviser, and approved by the Academic Standing Committee,

b) a comprehensive oral examination at the end of the Ph.D.II, and

c) research leading to a Ph.D. thesis followed by an oral defense.

Highly qualified B.Sc. graduates may be admitted directly to the Ph.D.I year. Students with the M.Sc. degree may be admitted to either the Ph.D.I or Ph.D.II year, depending on their background. Students are required to take 18 credits of graduate course study in the Ph.D.I year, and 6 credits plus a comprehensive oral examination in the Ph.D.II year. There is no language requirement for the Ph.D. degree.

23.6 Graduate Courses

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

The names of course instructors are listed on the Course Timetable available on ***info*McGill** via the Web http://www.mcgill.ca/students/courses/.

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

● Denotes courses not offered in 2001-02.

186-501B CRYSTAL CHEMISTRY. (3) (2 hours lectures, 1 hour seminar) Discussion of crystal structures of important mineral groups, especially oxides, sulfides and silicates. Mechanisms of solid solution. Relationship of structure to morphology and to chemical and physical properties of crystalline matter.

186-510A GEODYNAMICS AND GEOMAGNETISM. (3) (3hours lecture) (Prerequisites: 186-320A, 186-350B, 189-319B or permission of the instructor.) The gravity field of the Earth and planets, body and orbital dynamics of the Earth, moon and planets, tidal interactions of the Earth-moon-sun system, deformation of the Earth under static and dynamic loads, the magnetic field of the Earth and planets: the magnetosphere, the external radiation belts, magnetohydrodynamic models of the core dynamo, geochemical convection in the core, fluid-dynamic motions of the outer core, dynamics of the inner core.

● **186-519A ISOTOPE GEOLOGY.** (3) (3 hours lectures) (Prerequisites: U2 core program.)

186-525B SUBSURFACE MAPPING. (3) (Prerequisite: 186-455A or permission of instructor.) This course will provide participants the opportunity to learn how different types of data (wireline logs, seismic, etc.) are employed to map geological features in the subsurface. Lectures will teach participants about the physical basis of each of the data types, and the basic mapping and analytical techniques (e.g., geostatistics, gridding) that are employed in subsurface mapping. The principal focus will be on applying these techinques and concepts to real-world data sets.

186-530A VOLCANOLOGY. (3) (2 hours lectures, 3 hours laboratory) (Prerequisites: 186-212B and 186-321B, or permission of instructor.) The physical mechanisms which drive volancoes and volcanic activitiy are presented. Descriptive, practical and theoretical approaches to the study of volcanoes are discussed.

● **186-540B PHANEROZOIC GEOLOGY OF N. AMERICA.** (3)

● **186-542A CHEMICAL OCEANOGRAPHY.** (3) (Prerequisites: 180-213A,B, 180-257D or equivalents, or registration in Graduate Program in Oceanography.)

● **186-545B LOW TEMPERATURE GEOCHEMISTRY.** (3) (Prerequisites: 180-203A/213B, 186-212B, 186-312B)

● **186-546A DIAGENESIS.** (3) (2 lecture, 3 lab/seminars) (Prerequisites: 186-212B, 186-220B, 186-312A)

● **186-547A HIGH-TEMPERATURE GEOCHEMISTRY.** (3) (Prerequisites: 180-203/4 or 180-213 or permission of instructor.)

● **186-548A PROCESSES OF IGNEOUS PETROLOGY.** (3) (2hours lecture, 1 hour seminar) (Prerequisite: 186-423B)

● **186-549B HYDROGEOLOGY.** (3) (3 hours lecture, 1-2 hours lab) (Prerequisite: permission of the instructor)

186-550A,B SELECTED TOPICS IN EARTH & PLANETARY SCIENCES I. (3) (2 hours seminar, permission of Department undergraduate adviser) Research seminar and readings in topics

concerning some aspects of current development in geological sciences.

186-551A,B SELECTED TOPICS IN EARTH & PLANETARY SCIENCES II. (3) (2 hours seminar, permission of Department undergraduate adviser) Research seminar and readings in topics concerning some aspects of current development in geological sciences.

186-552A,B SELECTED TOPICS. (3) Research seminar and/or lecture with readings in topics concerning aspects of current interest in Earth and Planetary Sciences.

186-570A COSMOCHEMISTRY. (3) (3 hours lecture) (Prerequisites: 186-220B, 186-210A or permission of instructor.) Examines the implications of phase equilibria and the compositions of meteorites and the solar system for the formation and internal differentiation of the terrestrial planets and the nature of chemical fractionation processes in both planetary interiors and the solar system as a whole.

186-580B AQUEOUS GEOCHEMISTRY. (3) (3 hours lecture) (Prerequisites: 186-210A, 186-212B or permission of instructor.) The use of chemical thermodynamics to study fluid-rock interactions with an emphasis on the aqueous phase. The course introduces basic concepts and discusses aqueous complexation, mineral-surface adsorption, and other controls on crustal fluid compositions. Applications range from considering contaminated groundwater systems to metamorphic reactions.

186-590B APPLIED GEOCHEMISTRY SEMINAR. (3) (3 hours seminar) (Prerequisite: permission of instructor.) Seminar course devoted to field case-studies that illustrate the applications of geochemical principles to solving geologic problems. Each student prepares and leads a class devoted to a geochemical subject of their own choosing.

- **186-601A PETROLOGY OF FELSIC IGNEOUS ROCKS.** (3) (Prerequisite: 186-423A or equivalent.)
- **186-603B PETROLOGY OF MAFIC IGNEOUS ROCKS.** (3) (Prerequisite: 186-423A or equivalent.)

186-604D ORE PETROLOGY. (6) (3 hours lecture or seminar) Application of geochemistry and petrology to the study of selected ore types.

- **186-613A REGIONAL STRUCTURAL ANALYSIS.** (3) (2 hours lectures, 2 hours lab)
- **186-631E FIELD STUDIES IN OROGENIC BELTS.** (3) (2-week field course in May, plus assigned papers)

186-636A TIME SERIES ANALYSIS: ADVANCED GEOPHYSICAL APPLICATIONS. (3) (3 hours) Analysis of geophysical data represented in time- or space-series form: multichannel and multidimensional stochastic processes and their analysis using a) the methods of linear and non-linear filter theory; b) harmonic analysis; c) probabilistic forecasting/prediction theory; d) procedures in deconvolution; e) estimation and detection theory.

186-638A EVOLUTION OF PLANETS. (3) The formation of the solar system, dynamics of planetary nebulae, accretion of planets, dynamics of the planetary system, thermal evolution and internal structure of planets, and origin of the planetary magnetic field.

186-644A TOPICS IN ADVANCED EARTH SCIENCES I. (3) (3 hours lectures or seminars) A survey of a research topic of particular current interest.

186-645B TOPICS IN ADVANCED EARTH SCIENCES II. (3) (3 hours lectures or seminars) A survey of a research topic of particular current interest.

- **186-650A GREENSTONE BELTS.** (3) (2 hours lecture, 3 hours lab)
- **186-655B LITHOGEOCHEMISTRY OF ALTERED ROCKS.** (3) (2 hours lecture, 3 hours lab)
- **186-660D SEMINAR IN OCEANOGRAPHY.** (2)

186-697A,B THESIS PREPARATION I. (9) Independent study, theoretical and/or laboratory work in connection with the development of an M.Sc. thesis. Success in the course is dependent on presentation of an adequate progress report to the supervisory committee.

186-698A,B THESIS PREPARATION II. (12) Independent study, theoretical and/or laboratory work in connection with the development of an M.Sc. thesis. Success in the course is dependent on presentation of an adequate progress report to the supervisory committee.

186-699A,B THESIS PREPARATION III. (12) Independent study, theoretical and/or laboratory work in connection with the development of an M.Sc. thesis. Success in the course is dependent on presentation of an adequate progress report to the supervisory committee.

186-700D PRELIMINARY DOCTORAL EXAMINATION.

- **186-706D ADVANCED SEDIMENTOLOGY.** (6) (2 hours lectures or seminar and 3 hours lab)
- **186-708D ADVANCED STRATIGRAPHY.** (6) (3 hours lectures or seminar)
- **186-710A GEOTECTONICS.** (3) (2 hours lectures or seminars)

186-713A ECONOMIC GEOLOGY I. (3) (3 hours seminar) (Prerequisite: undergraduate course in economic geology or permission of the instructor.) Physicochemical controls of hydrothermal mineral deposition. Discussion of fluid inclusion theory and application; stable isotope systematics, wall-rock alteration; ore mineral solubility and speciation; and mechanisms of mineral deposition.

186-714B ECONOMIC GEOLOGY II (3) (3 hours seminar) (Prerequisite: undergraduate course in economic geology or permission of the instructor.) Genesis of hydrothermal mineral deposits. Discussion of geological setting, fluid and metal sources, method of metal transport, and factors controlling metal concentration for a selection of hydrothermal mineral deposit types.

186-715B INSTRUMENTAL ANALYSIS. (3) (3 hours lectures, 3 hours lab) Application of analytical instrumental techniques to obtaining reliable chemical data from complex (geological and environmental) materials, and evaluation of the data in problem solving. Electron Microprobe Analysis (WDS and EDS), Scanning Electron Microscopy, X-ray Fluorescence Spectrometry, X-ray Diffraction, Atomic Spectroscopy (Atomic Absorption, ICP and ICP-MS). Neutron Activation Analysis.

- **186-716B ECONOMIC GEOLOGY LABORATORY.** (3) (2 hours lectures, 3 hours lab per week)
- **186-717D ADVANCED EARTH PHYSICS.** (6) (2 hours lecture or seminar and assignments) .
- **186-719A ISOTOPE GEOLOGY SEMINAR.** (3) (2 hours seminar and assigned reading) (Prerequisites: 186-519A and permission of instructor.)
- **186-721D RECENT SEDIMENTS AND MARINE GEOLOGY.** (6) (3 hours seminar, lectures and assignments) .

186-725A INDEPENDENT STUDIES IN EARTH & PLANETARY SCIENCES. (3) (Not available to students who have taken 186-720D. Ineligible for credit in M.Sc. Thesis program.) Research and/or reading project. Independent study under the guidance of qualified staff in areas of special interest to the student.

186-726B INDEPENDENT STUDIES IN EARTH & PLANETARY SCIENCES. (3) (Not available to students who have taken 186-720D. Ineligible for credit in M.Sc. Thesis program.) Research and/or reading project. Independent study under the guidance of qualified staff in areas of special interest to the student.

24 East Asian Studies

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Chair — TBA

Director of Graduate Program — TBA

24.1 Staff

Professors
R.D.S. Yates; B.A., M.A.(Oxon.), M.A.(Calif.), Ph.D.(Harv.)
K. Dean; B.A.(Brown), M.A., Ph.D.(Stan.)

Associate Professors
G. Fong; B.A., M.A.(Tor.), Ph.D.(Br. Col.)
T. Lamarre; B.A.(Georgetown), M.A., Ph.D.(Chic.), D.Sc.(Aix-Marseille II)

Assistant Professor
T. Looser; B.A.(UC Santa Cruz), M.A., Ph.D.(Chic.)

Faculty Lecturers
J. Chang; B.A.(Taiwan), M.A.(Harv.)
S. Hasegawa; M.A.(Montr.)
M. Kim; B.A., M.A.(Montr.)
B. Wang; B.A.(Heilongjiang), M.A.(Calg.)

24.2 Programs Offered

M.A. in East Asian Studies (Ad Hoc).

Ph.D. in East Asian Studies (Ad Hoc).

24.3 Admission Requirements

General

TOEFL and GRE (if applicable).

Applicants who have an undergraduate degree from outside Canada will need to take the Graduate Record Examination. A minimum TOEFL score of 577 on the paper-based test (or 233 on the computer-based test) is required for all applicants whose native language is not English.

M.A.

Applicants must hold, or expect to hold by September of the year of entry, a bachelor's degree for entry into the M.A. program. Applicants should have a Bachelor of Arts degree with a specialization in East Asia; applicants without this specialization who possess a strong disciplinary background are also invited to apply. Those who have experience with an Asian language, but no formal course work, will be required to take a placement test on admission. Those without knowledge of an Asian language will be required to take three qualifying terms (fall, winter, summer) in which they will complete the second year of language; a minimum of a B+ average must be maintained.

Ph.D.

Applicants must hold, or expect to hold by September of the year of entry, a master's degree in East Asian Studies for entry into the Ph.D. program.

24.4 Application Procedures

Applications will be considered upon receipt of:

1. application form;
2. two copies of offical transcripts sent by the university;
3. two letters of reference;
4. $60 application fee;
5. current curriculum vitae (resumé) and a statement of purpose (approximately 500 words for Master's and 10 pages for Ph.D.) indicating the field in which the applicant wishes to study and the reasons for applying to the program.

All of the above should be submitted directly to the Graduate Director, Department of East Asian Studies.

Deadline: March 1st for September admissions

24.5 Program Requirements

Program Requirements for the M.A. Degree (Ad Hoc)
(45 credits)

The Department only offers a thesis option. The M.A. program with thesis includes:

a) four 3-credit courses (12 credits),
b) one 3-credit seminar in theory/methodology (3 credits),
c) one 6-credit seminar or two 3-credit seminars (6 credits), and
d) thesis (24 credits).

Language Courses:

1. A maximum of 6 credits of language courses at the 500-level or in a classical Asian language may be counted towards course requirements.
2. Students must have fourth-level language equivalency by the completion of their M.A. program.

Program Requirements for the Ph.D. Degree (Ad Hoc)

After successfully completing the M.A. degree or its equivalent (45 credits minimum), a student will be admitted to the second year of the Ph.D. program. The Graduate Studies Committee will assign an advisory committee to advise the student and specify the student's course program.

Exceptional students with appropriate background at the undergraduate level may be admitted directly into the Ph.D. program.

Students must complete at least 24 course credits, with a grade point average of 3.5 or better: this course work must be chosen to identify three distinct fields for the Comprehensive Evaluation. Students may take up to two 3-credit courses or one 6-credit course in another department with the approval of the Graduate Studies Committee.

There are four requirements for obtaining the Doctoral degree:

1. Course work – 24 credits at the 600 or 700 level.
2. Language – Candidates will be required to demonstrate reading knowledge of a second Asian language, which may include either modern or literary (classical) language, in addition to the primary Asian language of their research. Candidates will also be expected to demonstrate reading knowledge of both French and English. They may also be required to take a third European language, classical (literary) Chinese, or Japanese, if the Graduate Studies Committee decides those languages are essential for the candidate's research.
3. Ph.D. Comprehensive Evaluation – After the session in which the course work is completed, and no more than one year later except in exceptional circumstances and approved by the Graduate Studies Committee, a candidate will be required to pass the Comprehensive evaluation.
4. Doctoral Dissertation – Within six months after successful completion of the Ph.D. Comprehensive Evaluation, doctoral students should submit to the Graduate Studies Committee, after consultation with the Graduate Program Director and their potential thesis supervisor, a thesis proposal not exceeding five pages. Before submission of the dissertation, candidates are normally required to spend time in Asia researching their project. Research leading to original scholarship is a prerequisite for the acceptance of a Ph.D. thesis.

24.6 Courses for Graduate Students (M.A. and Ph.D.)

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

The names of course instructors are listed on the Course Timetable available on ***info*McGill** via the Web http://www.mcgill.ca/students/courses/.

Please consult the Department to see which courses are being given in any one academic year.

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

117-501A ADVANCED TOPICS IN JAPANESE STUDIES I. (3)
117-502B ADVANCED TOPICS IN JAPANESE STUDIES II. (3)
117-503A ADVANCED TOPICS IN CHINESE STUDIES I. (3)
117-504B ADVANCED TOPICS IN CHINESE STUDIES II. (3)
117-515A,B SEMINAR: BEYOND ORIENTALISM. (3)
117-529A,B CONTEMPORARY CHINA: ANALYSIS OF CHANGE. (3)
117-530D FOURTH LEVEL CHINESE. (6)
117-537D CHINA TODAY THROUGH TRANSLATION. (6)
117-540D FOURTH LEVEL JAPANESE. (6)
117-543A,B CLASSICAL JAPANESE I. (3)
117-544A,B CLASSICAL JAPANESE II. (3)
117-547A,B ADVANCED READING AND TRANSLATION IN JAPANESE. (3)
117-550A,B CLASSICAL CHINESE POETRY. (3)
117-551A,B TECHNOLOGIES OF THE SELF IN EARLY CHINA. (3)
117-559A,B ADVANCED TOPICS IN CHINESE LITERATURE. (3)
117-562A,B JAPANESE LITERARY THEORY AND PRACTICE. (3)
117-563A,B IMAGES, IDEOGRAMS, AESTHETICS. (3)
117-564A,B STRUCTURES OF MODERNITY: JAPAN. (3)
117-569A,B ADVANCED TOPICS IN JAPANESE LITERATURE. (3)
117-580A,B JAPAN: THE SOCIOPOLITICAL FRAMEWORK. (3)
117-584A,B INDUSTRY IN JAPAN. (3)
117-590A,B MULTIPLE NARRATIVES OF THE "ORIENT". (3)
117-600A,B EAST ASIAN STUDIES I. (3)
117-601A,B EAST ASIAN STUDIES II. (3)
117-651A,B SEMINAR IN TAOIST STUDIES I. (3)
117-652A,B SEMINAR IN TAOIST STUDIES II. (3)
117-653A,B CHINESE POPULAR CULTURE I. (3)
117-654A,B CHINESE POPULAR CULTURE II. (3)
117-655A,B PREMODERN CHINESE POETRY. (3
117-656A,B PREMODERN CHINESE NARRATIVE. (3)
117-657A,B WOMEN'S WRITINGS IN TRADITIONAL CHINA. (3)
117-660A,B SEMINAR: JAPANESE FICTION. (3)
117-661A,B PREMODERN JAPANESE POETRY AND NARRATIVE. (3)
117-662A,B SEMINAR: POPULAR CULTURE IN JAPAN. (3)
117-663A,B SEMINAR: JAPANESE CULTURE AND THOUGHT. (3)
117-680A,B SEMINAR: SOCIAL CHANGE IN JAPAN. (3)
117-690A,B THESIS RESEARCH I. (3)
117-691A,B THESIS RESEARCH II. (3)
117-692A,B THESIS RESEARCH III. (3)
117-693A,B THESIS RESEARCH IV. (3)
117-694A,B THESIS RESEARCH V. (3)
117-695A,B THESIS RESEARCH VI. (3)
117-696D THESIS RESEARCH VII. (6)
117-700D EAST ASIAN STUDIES III. (6)
117-701D PH.D. COMPREHENSIVE. (6)
117-750A,B CHINESE LITERARY THEORY AND CRITICISM. (3)

Courses in other departments:

Department of Anthropology
151-654A,B Anthropology of China. (3)

Department of History
101-611D Seminar in Traditional Chinese History. (6)
101-618A,B Readings in East Asian History. (3)
101-658D Seminar in Chinese History. (6)
101-668D Japanese Intellectual History. (6)

Department of Political Science
160-649A,B The Mass Approach to Political Development: China. (3)

Faculty of Management
270-625A,B Asia Pacific Management. (3)
272-685A,B Cross Cultural Management. (3)

Faculty of Religious Studies
260-546A,B Indian Philosophy. (3)
260-548A,B Indian Buddhist Metaphysics. (3)
260-549A,B Topics in East Asian Philosophy. (3)
260-556A,B Issues in Buddhist Studies (3)
260-557A,B Asian Ethical Systems. (3)
260-651A,B Indian Buddhist Philosophy. (3)
260-653A,B Visistadvaita Vedanta. (3)
260-655A,B Buddhist Epistemology. (3)
260-658A,B Japanese Buddhist Philosophy. (3)
260-687A,B Research in Comparative Religions I. (3)

25 Economics

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Chair — Christopher Green

25.1 Staff

Emeritus Professors
Earl F. Beach; B.A.(Queen's), A.M., Ph.D.(Harv.)
Irving Brecher; B.A.(McG.), M.S., Ph.D.(Harv.)
Kari Polanyi-Levitt; B.Sc.(Lond.), M.A.(Tor.)

Professors
Robert D. Cairns; B.Sc.(Tor.), Ph.D.(M.I.T.)
Antal Deutsch; B.Com.(Sir G. Wms.), Ph.D.(McG.)
John Galbraith; B.A.(Queen's), M.Phil., D.Phil.(Oxon.) *(James McGill Professor) (on leave 2001-02, second term)*
Christopher Green; M.A.(Conn.), Ph.D.(Wis.) *(on leave 2001-02)*
Joseph Greenberg; B.A., M.A., Ph.D.(Heb. U. of Jer.)
Jagdish Handa; B.Sc.(Lond.), Ph.D.(Johns H.)
Ngo van Long; B.Ec.(LaT.), Ph.D.(A.N.U.)
Robin Thomas Naylor; B.A.(Tor.), M.Sc.(Lond.), Ph.D.(Cantab.)
J.C. Robin Rowley; B.Sc., M.Sc., Ph.D.(Lond.)

Associate Professors
Venkatesh Balasubramanian; B.A.(Delhi), M.B.A.(Indian Inst. of Mgmt), M.A., Ph.D.(C'nell)
Myron Frankman; B.Mgt.E.(Renss.), Ph.D.(Texas)
George Grantham; B.A.(Antioch), M.A., Ph.D.(Yale)
Franque Grimard; B.A.(York), Ph.D.(Prin.)
John Iton; B.A.(McG.), Ph.D.(Johns H.)
C. John Kurien; B.A.(Kerala), M.A., Ph.D.(Vanderbilt)
Mary MacKinnon; B.A.(Queen's), M.Phil., D.Phil.(Oxon.) *(on leave 2001-02)*
Christopher T.S. Ragan; B.A.(Vic. B.C.), M.A.(Queen's), Ph.D.(M.I.T.)
Lee Soderstrom; B.A., Ph.D.(Calif.)
Thomas Velk; M.S., Ph.D.(Wis.)
Alexander Vicas; B.Com.(McG.), M.A., Ph.D.(Prin.)
William Watson; B.A.(McG.), Ph.D.(Yale)
Victoria Zinde-Walsh; M.A.(Wat.), M.Sc., Ph.D.(Moscow St.)

Assistant Professors
Suryapratim Banerjee; B. Stat., M. Stat.(Indian Inst. of Statistics, Calcutta, New Delhi), M.A., Ph.D.(Boston)
Daniel Parent; B.A., M.A.(Laval),Ph.D.(Montr.)

Postdoctoral Fellow
Chris Minns; B.A.(Queen's), M.A.(Alta.), Ph.D.(Essex)

25.2 Programs Offered

M.A. in Economics, thesis and non-thesis options.

Ph.D.

Because this Calendar is prepared early in the year, changes may take place after it has been printed. Students are advised to contact the Department Office for supplementary information which may be important to their choice of program.

25.3 Admission Requirements

An Honours B.A. in Economics is the normal requirement, although students holding an ordinary B.A., whether in economics or another discipline, may also be eligible for admission. Students judged by the admissions committee to have deficiencies in their preparation in economics may be admitted to a qualifying year in which they undertake advanced undergraduate work.

Students who have not previously passed a suitable course in statistics must take the undergraduate honours statistics course, Economics 154-257D. A course in the history of economic thought is also a prerequisite for a graduate degree in economics, and students who have not taken such a course will be required to take Economics 460A and 461B or 154-660A/B (the M.A. course in History of Economic Thought). Students are also expected to have completed or to complete three semesters of introductory calculus and at least one semester of linear algebra.

25.4 Application Procedures

Applications will be considered upon receipt of:

1. application form;
2. two copies of official transcripts sent by the university;
3. two letters of reference;
4. $60 application fee.

Information and application form can be downloaded from McGill University, Economics Department. Website: http://www.arts.mcgill.ca/programs/econ. Hard copy of the application form is sent only upon request.

Deadline: February 1st for financial consideration.

25.5 Program Requirements

Lectures and examinations in the graduate program (M.A. and Ph.D.) in Economics are given in Macroeconomics, Microeconomics and several fields: Econometrics; Economic Development; Economic History; Industrial Organization; International Economics; Labour Economics; Monetary Economics; Public Finance; Mathematical Economics; Advanced Theory. Courses at the 600 level are usually taught in the first-term. Seminars/courses at the 700 level are offered in many of the fields listed above. They are generally given in the second term and normally have as a prerequisite the corresponding 600-level course.

Requirements for the M.A. Degree (48 credits)

I. M.A. with Thesis:

The requirements for the Master's degree are:

1. Successful completion of the following courses with a grade in each of at least 65%;
   154-610A (3 credits) Microeconomic Theory I
   154-620A (3 credits) Macroeconomic Theory I

   Twelve complementary credits which must include either 154-665A,B (Quantitative Methods) (3 credits) or 154-662D (Econometrics) (6 credits)

   A minimum of 6 credits must be taken in the same field.
2. Completion of a Master's thesis, the subject of which must be approved by a thesis committee.

The total thesis program requirement is 48 credits (18 credits of course work and 30 credits for the thesis). An average grade of 70% in approved courses is needed for graduation.

Econometrics 154-662D or equivalent is strongly recommended but will not meet the 6 credit field requirement for the M.A.

II. M.A. with Research Paper:

1. Successful completion of the following courses with a grade in each of at least 65 per cent:

   Six required credits:
   154-610A (3 credits) Microeconomic Theory I
   154-620A (3 credits) Macroeconomic Theory I

   Eighteen complementary credits which must include either 154-665A,B (Quantitative Methods) (3 credits) or 154-662D (Econometrics) (6 credits)

   A minimum of 6 credits must be taken in the same field.
2. A research paper of about 50 pages in length.

   The total non-thesis program requirement is 48 credits (24 credits for course work and 24 credits for the research report). An average grade of 70% in approved courses is needed for graduation.

Econometrics 154-662D or equivalent is strongly recommended but will not meet the six credit field requirement for the M.A.

Residency requirement for the M.A. degree: Three full terms for the M.A. degree one of which can be an approved summer term. Many students are able to complete the M.A. requirements in one calendar year.

III. M.A. Degree Program Non-thesis Option in Social Statistics:

The program complements disciplinary training with research experience applying statistical methods to Statistics Canada data (or equivalent). Students will normally complete normal program course requirements, supplemented by further statistical courses, as advised by the Option advisor, and subject to approval by the home department. Students will complete a statistics-based M.A. research paper (Economics, Political Science, Sociology) or thesis (Geography) in conjunction with an interdisciplinary capstone seminar.

Acceptance into the program is by application to the Social Statistics Option Committee and is contingent on acceptance into the M.A. program in one of the participating departments (Economics, Geography, Political Science, Sociology), which in turn requires meeting Graduate Faculty admission requirements.

REQUIREMENTS FOR THE Ph.D. DEGREE

The requirements for the doctoral degree are:

1. 18 credits in Economics beyond the M.A. requirements, including successful completion of the Econometrics course (662D) or its equivalent. Apart from 662 or equivalent, at least two of these courses must be in a single field.
2. Successful completion of the Ph.D. Written Comprehensive Examination.
3. A dissertation.
4. Three years of residence (credit for one year may be granted for master's work at McGill or for graduate study at another university).

Ph.D. Comprehensive Examination. This examination consists of written examinations in Macroeconomics, Microeconomics and two fields. A third field is also required, although this requirement is satisfied by successful completion of two half-year courses in that field.

Doctoral Dissertations Doctoral dissertations make original contributions to the literature. The topic must be approved by a two-person supervisory committee whose Chair is the student's Director of Research. The completed thesis must be approved by an external examiner as well as by two internal examiners before the student may defend the work at a formal oral examination.

25.6 Courses for Higher Degrees

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

The names of course instructors are listed on the Course Timetable available on ***info*McGill** via the Web http://www.mcgill.ca/students/courses/.

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

● Denotes courses not offered in 2001-02.

154-525B PROJECT ANALYSIS. (3) (Open to advanced undergraduate students.) (Prerequisite: 154-250D, 154-352D or equivalent.) A course in cost benefit analysis for graduate and advanced undergraduate students.

154-534B PENSION CRISIS. (3) The consequences of commitments made by governments in the area of old age pensions and the implications of the resulting tax burden. An international perspective will be adopted.

154-546A GAME THEORY. (3) (Prerequisite: 154-230D or 154-250D) (Open to advanced undergraduate students.) This course introduces students to game theory, the branch of the social sciences that focuses on the formal modelling and analysis of human interactions and strategic behaviour. Basic concepts in cooperative and non-cooperative games are applied to economic models.

154-577A MATHEMATICAL ECONOMICS I. (3) (Prerequisite: 189-301A/B or equivalent) A mathematical treatment of basic economic theory.

● **154-578A,B MATHEMATICAL ECONOMICS II.** (3) (Prerequisite: 154-577A/B)

● **154-602A,B ECONOMIC HISTORY.** (3)

154-610A MICROECONOMIC THEORY I. (3) This is the first in a two-course sequence in microeconomics.

The core microeconomics sequence (154-610A, 154-611B) provides a rigorous coverage of the economic foundation upon which economic fields are built. Most of the sequence is devoted to building up this foundation of consumer and firm optimisation (including choice under uncertainty), partial and general equilibrium, and welfare economics. The remainder of 154-611B covers special topics that vary from year to year. These are likely to be drawn from the following: social choice; externalities and public goods; models of asymmetric information; the principal-agent framework; search; basic game theory.

154-611B MICROECONOMIC THEORY II. (3) This is the second in a two-course sequence in microeconomics.

154-620A MACROECONOMIC THEORY I. (3) This course is the first in a two-course sequence in macroeconomics. The course offers a thorough treatment of the fundamentals of macroeconomic theory. Emphasis is placed on the construction of economic models with microeconomic foundations. Topics include market-clearing and non-market-clearing models, capital accumulation, business cycles, monetary policy and fiscal policy.

154-621B MACROECONOMIC THEORY II. (3) This is the second in a two-course sequence in macroeconomics. The course provides an in-depth analysis of selected issues in macroeconomic theory, extending and complementing the coverage provided in 154-620A.

● **154-622,B PUBLIC FINANCE.** (3)

154-623A MONEY AND BANKING. (3) A rigorous analysis of the demand and supply of money and the role that it plays in the economy. Study of the ideas of the major schools of thought in monetary economics.

154-624B INTERNATIONAL ECONOMICS. (3) A detailed examination of theories and policies in international trade and finance.

● **154-631A,B HISTORICAL EXPERIENCE OF ECONOMIC DEVELOPMENT.** (3)

154-634B ECONOMIC DEVELOPMENT. (3) A systematic treatment of the characteristics and problems of economic development in underdeveloped countries.

154-637A INDUSTRIAL ORGANIZATION AND REGULATION. (3) An analysis of the nature of the firm, industrial structure and the effect of structure on firm and industry behaviour and performance.

154-641B LABOUR ECONOMICS. (3) A synthesis of theoretical developments in the area of labour economics with stress upon problems of empirical testing.

154-650A,B RESEARCH I. (3) Preparation for work on M.A. thesis and M.A. research report.

154-651A,B RESEARCH II. (3) Same description as above.

154-652A,B RESEARCH III. (3) Same description as above.

154-653A,B RESEARCH IV. (3) Same description as above.

● **154-660B HISTORY OF ECONOMIC THOUGHT.** (3)

154-662D ECONOMETRICS. (6) A broad treatment of econometric methods, with particular reference to time series processes. Estimation of linear and non-linear models, GLS, IV, Maximum Likelihood, parametric specification testing for linear and non-linear hypotheses, diagnostic testing (autocorrelation, heteroskedasticity, normality, parameter constancy, etc.), modelling technique, non-stationary data processes.

154-665B QUANTITATIVE METHODS. (3) A survey of quantitative methods frequently used in economic research. Special emphasis will be placed upon the formulation and evaluation of econometric models. Illustrations will be drawn from the existing empirical literature in economics. Required for all Ph.D. students who have not taken Econometrics as a field.

154-670A,B THESIS I. (6)

154-671A,B THESIS II. (6)

154-672A,B THESIS III. (6)

154-680A,B M.A. REPORT I. (3) The M.A. Report must demonstrate the candidate's ability to do independent work at the graduate level in a particular field of economics. While length will vary with the subject matter, it is expected that on average reports will be about 50 pages long. The Report will be graded jointly by two members of the Department. The supervisor will normally be one of the examiners.

154-681A,B M.A. REPORT II. (3) Same description as above.

154-682A,B M.A. REPORT III. (3) Same description as above.

154-683A,B M.A. REPORT IV. (3) Same description as above.

● **154-702A,B ECONOMIC HISTORY.** (3)

154-705A,B READING COURSE ON SELECTED TOPICS IN ECONOMICS. (3) Reading course in Economics.

154-706A,B SELECTED TOPICS. (3) (Prerequisites: 154-610, 154-620 and 6 additional credits at the 600 level) Reading course in Economics.

● **154-710B SELECTED TOPICS IN ECONOMICS.** (3)

● **154-712A,B PUBLIC FINANCE.** (3)

● **154-720A ADVANCED GAME THEORY.** (3)

154-721B ADVANCED MONETARY THEORY. (3) Selected topics in monetary theory, the theory of monetary policy, and the history of monetary institutions.

● **154-722B MACROECONOMICS.** (3)

154-724A INTERNATIONAL ECONOMICS. (3) Selected problems in international trade, foreign exchange and international movements of capital.

● **154-734B ECONOMIC DEVELOPMENT.** (3)

154-737B INDUSTRIAL ORGANIZATION AND REGULATION. (3) Builds on material covered in 154-637A. Problems are examined in greater depth with specific topics varying from year to year.

● **154-741B ADVANCED LABOUR ECONOMICS.** (3)

154-742B EMPIRICAL MICROECONOMICS. (3) (Prerequisite: First term of 154-662D and either 154-634A or 154-641A, or consent of

the instructor.) Surveys the empirical techniques used in applied microeconomic fields, particularly development and labour economics. Focus is on the formulation of empirical models derived from economic theory, and on various estimation methodologies, including panel data econometrics, limited dependent variable models, and duration analysis. A hands on approach is emphasized.

154-744B HEALTH ECONOMICS. (3) The emphasis will be on describing and analyzing the structure and performance of the Canadian health system, though some attention will be given to recent attempts by the federal and provincial governments to deal with current problems in this field. Readings will be selected from the economics and health literature.

- **154-750A SELECTED TOPICS IN MICROECONOMICS.** (3)
- **154-751A SELECTED TOPICS IN MACROECONOMICS.** (3)
- **154-752B TOPICS IN FINANCIAL ECONOMICS.** (3)
- **154-753A SELECTED TOPICS IN MATHEMATICAL ECONOMICS.** (3)
- **154-760B HISTORY OF ECONOMIC THOUGHT.** (3) .
- **154-761A ECONOMETRICS – TIME SERIES ANALYSIS.** (3) (Not open to students who have taken 154-762D.)

154-762A ECONOMETRICS – ASYMPTOTIC AND FINITE – SAMPLE THEORY. (3) Exact and asymptotic distribution theory in econometrics: basic results for estimation and inference in regression models, extensions and other selected topics including nonparametric and distribution-free methods for econometric models.

- **154-763A FINANCIAL ECONOMETRICS.** (3)
- **154-764B SELECTED TOPICS IN APPLIED ECONOMETRICS.** (3)

154-767A,B APPLIED QUANTITATIVE ECONOMICS. (3) Co-ordinated quantitative research projects under the guidance of the instructors to increase facility in quantitative research.

154-799D PH.D. COMPREHENSIVE EXAMINATION.

Courses offered only in some years:
154-738A,B TOPICS IN ECONOMIC THEORY.
154-753B SELECTED TOPICS IN MATHEMATICAL ECONOMICS.
154-761A,B ECONOMETRICS-TIME SERIES ANALYSIS.

26 Educational and Counselling Psychology

Department of Educational and Counselling Psychology
Education Building, Room 513
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Montreal, QC H3A 1Y2

Telephone – Program Information: (514) 398-4241
Fax: (514) 398-6968
Website: http://www.education.mcgill.ca/ecp

Chair — TBA

Program Directors:

Professional Psychology Program Grouping/ Counselling Psychology — Theodore J. Maroun
School/Applied Child Psychology — Jacob A. Burack
Associate Program Director — Joyce F. Benenson (Applied Developmental Psychology)

Professional Education Program Grouping/ Educational Psychology — F. Gillian Rejskind
Associate Program Directors —
Joan Stafford (Family Life Education)
F. Gillian Rejskind (General Educational Psychology, Gifted Education, Inclusive Education, and Psychology of Gender)

Cognition and Instruction Program Grouping —
Susanne P. Lajoie
Associate Program Directors —
Susanne P. Lajoie (Educational Technology)
Lynn M^{c}Alpine (Adult Education)

26.1 Staff

Emeritus Professors
Eigil Pedersen, B.A.(Sir G. Wms.), M.A.(McG.), Ed.D.(Harv.)
Howard A. Stutt, B.A.(Queen's), B.Ed., M.Ed.(Montr.), F.C.C.T.

Professors
Mark W. Aulls, B.S.(Ball St.), M.Ed.(Ind.), Ed.D.(Georgia)
Jacob A. Burack, B.A.(Col.), M.S., M.Phil., Ph.D.(Yale)
Glenn F. Cartwright, B.A.(Sir G. Wms.), M.A.(McG.), Ph.D.(Alta.), F.A.A.S.P., F.C.C.T.
Jeffrey L. Derevensky, B.A.(C. W. Post), M.A., Ph.D.(McG.)
Janet G. Donald, B.A., M.A.(W. Ont.), Ph.D.(Tor.) *(joint appt. with the Centre for University Teaching and Learning)*
Florent R. Dumont, A.B.(Col.), M.S.(S. Conn. St.), Ed.D.(Mass.)
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Susanne P. Lajoie, B.A., M.A.(McG.), Ph.D.(Stan.)
Bruce M. Shore, B.Sc., M.A.(McG.), Ph.D.(Calg.)

Associate Professors
Joyce F. Benenson, B.Sc.(Duke), Ph.D.(Harv.)
Antonio Bernardelli, B.Sc.(Loy. Coll. Montr.), M.Ed., Ed.D. (McG.) (PT)
Robert J. Bracewell, B.Sc., M.A.(McM.), Ph.D.(Tor.)
Alain Breuleux, B.Sc., M.Sc., Ph.D.(Montr.)
Jack de Stefano, B.A.(Loy. Coll.. Montr.), M.A., Ed.D.(McG.) (PT)
Janet Donin, B.A.(Tor.), M.A.(Ill.), Ph.D.(Cal.) *(joint appt. with Integrated Studies in Education)*
James P. Hanrahan, B.A., B.Ed.(St. F. X.), M.A.(McG.), Ph.D.(Lond.)
Nancy L. Heath, B.A.(McG.), M.Ed.(Ott.), Ph.D.(Tor.)
Michael L. Hoover, B.S.(Tulane), M.A., M.Phil., Ph.D.(Col.)
Robert A. Lavers, B.A.(Bishop's), M.Sc., Ph.D.(McG.)
Evelyn Lusthaus, B.S., M.S., Ph.D.(S.U.N.Y. Buffalo)
Theodore J. Maroun, B.S.(S.U.N.Y. Potsdam), M.S.(Canisius), M.Ed.(S.U.N.Y. Buffalo), Ed.D.(Ind.)
Lynn McAlpine, B.A.(McG.), M.A.(C'dia), Ph.D.(Tor.) *(joint appt. with the Centre for University Teaching and Learning)*
David D. McWethy, B.S., M.A.(Mich. St.), Ph.D.(Iowa St.) *(joint appt. with Integrated Studies in Education)*
F. Gillian Rejskind, B.A., M.A.(Sask.), Ph.D.(C'dia)
Alenoush Saroyan, B.A.(Pahlavi), M.Ed.(Loy. U. Chic.), Ph.D.(McG.) *(joint appt. with the Centre for University Teaching and Learning)*
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Anastassios Stalikas, B.A.(C'dia), M.A., Ph.D.(Ott.)
Ronald Stringer, B.Sc., M.A., Ph.D.(Tor.)
Renée Stevens, B.A.(U.C.L.A.), M.A., Ph.D.(McG.) (PT)
Gary E. Torbit, B.Ed., M.Ed., Ph.D.(Alta.)
Barbara Wainrib, B.A.(Brooklyn Coll.), M.Sc.(McG.), D.Ed.(Mass.) (PT)
Cynthia B. Weston, B.A. (Georgetown), M.L.S.(S.U.N.Y.), D.Ed.(Wash.) *(joint appt. with the Centre for University Teaching and Learning)*

Assistant Professors
Miranda D'Amico, B.A., M.A.(C'dia), Ph.D.(McG.) (PT)
Marlene Dworkind, B.A., M.Ed.(McG.) (PT)
Marilyn Fitzpatrick, B.A.(Tor.), M.Ed., Ph.D.(McG.)
Ingrid E. Sladeczek, B.A., M.S., Ph.D.(Ariz.), A.A.(Maryland)

Adjunct Professors
Annie Alaku, B.Ed.(McG.) *(Kativik School Board)*
H. Don Allen, B.Sc.(McG.), M.S.T.M.(Santa Clara), Ed.M., Ed.D.(Rutgers)
Susan Butler, B.A., M.A.(McG.), Ph.D.(Lond.)
Franco Carnevale; B.Sc.N, MSCA, M.Ed., M.Sc., Ph.D.(McG.)
Bertha Dawang, B.A.(Sir G. Wms.), M.Ed.(McG.)
Valentina De Krom, B.A.(Ott.), M.Sc.(McG.) *(Nunavut Arctic College)*
Marcia A. B. Delcourt, M.A.B., B.Sc.(Bloomsburg), M.A., Ph.D.(Conn.) *(Western Connecticut University)*
Michael J. Dixon, B.A., B.Sc.(Trent), M.A., Ph.D.(C'dia) *(Douglas Hospital)*

Peter J. Doehring, B.A.(McG.), M.A., Ph.D. (C'dia) *(Douglas Hospital)*
Jeanne Eddisford; B.A.(Bishop's), M.Ed.(McG.), Ed.D.(Tor.)
Mary Elijassiapik, B.Ed.(McG.) *(Kativik School Board)*
Micki Lane, A.B.(U.C. Berkeley), M.A., Ph.D.(U.C.L.A.) *(MVM Communications)*
Elsa Lo; B.A.(Queen's), B.A.(Dalhousie), M.A., Ph.D.(McG.)
Henry Markovits; B.Sc.(McG.), M.Sc.(Sussex), Ph.D.(Montr.)
Judith A. MacArthur, B.A.(Sir G. Wms.), M.Ed.(McG.) *(Kativik School Board)*
Margaret O'Byrne; B.A.(C'dia), M.Ed.(McG.), Ph.D.(Montr.)
Susan Pinker, B.A.(McG.), M.A.Sc.(Waterloo)
Niki Saros, B.A., B.S.W.(McG.), M.A.Ps.(S.U.N.Y. N.Y.) (Summit School)
Leonard Shenker, B.Sc.(C.C.N.Y.), Ph.D.(McG.)
Marcos Silva; B.A.(C'dia), M.L.S., Ph.D.(McG.)
Michael Thomas, B.A.(Univ.Coll. Wales), M.A.(Montr.)
Vicki Zack, B.A., Ph.D.(McG.), M.A. (Montr.) (St. George's School)

Associate Members
Terry Gandell; B.A, M.Ed., Ph.D.(McG.)
Mary H. Maguire; B.A., B.Ed., M.A.(Montr.), M.Ed.(McG.), Cert. Reading(McG.), Ph.D.(Ariz.)
Joseph Rochford; B.A.(McG.), M.A.(Queen's), Ph.D.(C'dia)
Lalit K. Srivastava; B.Sc., M.Sc.(U of Allahabad, India), Ph.D.(Jawaharlal U., New Delhi)
Claire-Dominique Walker; B.Sc.(College Calvin, Geneva); Ph.D.(Salk Institute and U. of Geneva)
Laura Winer; B.A.,M.A.,Ph.D.(C'dia)

Part-time Instructors
Dawn Cruchet, Kathryn McMorrow, Rosemary Reilly, Joan Stafford.

26.2 Programs Offered

The Department offers M.Ed., M.A. (non-thesis), M.A., and Ph.D. programs in Counselling Psychology and in Educational Psychology as elaborated below. A Graduate Certificate in Counselling Applied to Teaching and a Graduate Diploma in School/Applied Child Psychology (Ph.D. Respecialization) were approved during the 1999-2000 academic year (refer to sections 10.5.1 Graduate Degrees in Counselling Psychology and 10.5.3 Professional Psychology Program Grouping.

At the undergraduate and continuing professional education levels, the Department also offers the Certificate in Inclusive Education, Certificate in Educational Technology, Certificate in First Nations and Inuit Student Personnel Services, Diploma in Family Life Education, and a B.A. Minor Concentration in Educational Psychology. A B.Ed. in Inclusive Education will begin in September 2002.

For information about graduate programs, please contact the appropriate Program Coordinator (Secretary):

Cognition and Instruction and Professional Education, including Adult Education, Applied Cognitive Science, Computer Applications in Education, Education of the Gifted, Family Life Education, General Educational Psychology, Higher Education, Inclusive (formerly "Special") Education, Instructional Psychology, Psychology of Gender — Mrs. Geri Norton, (514) 398-4244.

Professional Psychology, including Counselling Psychology, School/Applied Child Psychology, and Applied Developmental Psychology — Ms. Diane Bernier, (514) 398-4245, and the Psychoeducational and Counselling Clinic (514) 398-4641.

Graduate programs are organized under two degree designations, Counselling Psychology and Educational Psychology. Within Educational Psychology, degrees are offered in three program groupings, each covering different specializations. Please refer to the detailed subsections following for each to verify which degrees are available and specific requirements.

Educational Psychology Ph.D. programs are organized around a Major and Minor; students may freely select the combination of Major and Minor across program groupings, according to availability. Some of the specializations listed below are available only as Minors, and School/Applied Child Psychology is available only as a Major.

Cognition and Instruction
- Adult Education
  (Admission to this specialization has been suspended)
- Applied Cognitive Science
- Computer Applications in Education
- Higher Education
- Instructional Psychology

Professional Education
- Education of the Gifted
- Family Life Education
- General Educational Psychology
- Inclusive (formerly "Special") Education
- Psychology of Gender

Professional Psychology
- Applied Developmental Psychology
- Counselling Psychology
- School/Applied Child Psychology

Professional Accreditation

The Major in School/Applied Child Psychology of the Ph.D. in Educational Psychology is accredited by the American Psychological Association (APA).

The Ph.D. in Counselling Psychology is jointly accredited by the Canadian Psychological Association and the American Psychological Association.

The Ordre des psychologues du Québec (OPQ) has endorsed accreditation of both the Ph.D. in Counselling Psychology and the Ph.D. in Educational Psychology Major in School/Applied Child Psychology as this calendar went to press. Both applications have been forwarded to the Office des professions du Québec. Once accredited, graduates of these two programs who are also graduates of recognized undergraduate programs in Psychology (a list is available from the OPQ or the Department) will qualify for automatic admission to the professional practice of Psychology in Quebec. They presently receive "fast track" consideration under the admission procedures for the evaluation of "equivalence". Ph.D. graduates with any other undergraduate preparation, and all graduates until the accreditation process is complete, are eligible to apply for OPQ membership by review of equivalence of their training.

The M.A. (non-thesis) in Counselling Psychology is accredited by the Ordre professionnel des conseillers et conseillères d'orientation du Québec (OPCCOQ). Graduates of this program meet the professional requirements for licensing as a Counsellor in Quebec. This program does not qualify graduates to meet the requirements for certification as a Psychologist.

The M.Ed. Educational Psychology Concentration in Family Life Education is approved by the Association of Family Life Educators of Quebec (AFLEQ). AFLEQ has established reciprocal recognition of qualifications with the Canadian Association of Family Life Educators.

Graduate degrees in Educational or Counselling Psychology, and elsewhere in Education, do not lead to teaching certification – see the Undergraduate Education Calendar for B.Ed. programs. Holders of other undergraduate degrees may apply to enter the B.Ed. with advanced standing.

Research Facilities

The Department maintains working relationships with specialized centers and research groups offering opportunities for training and research to selected students. This includes the Centre for University Teaching and Learning, concerned with educational improvement and evaluation in higher education; the Centre for Medical Education whose activities focus on training in the health sciences; the Psychoeducational and Counselling Clinic which assists children, adolescents, and adults with learning and other problems; the Neuropsychology Department of Rivière des Prairies Hospital; the Taylor Adolescent Program conducted in association with the Learning Associates of Montreal; the Laboratory of Applied Cogni-

tive Science which conducts research on human learning and performance; the Apple Research Partnership Program (APR) which assists in developing Macintosh software; the Computer-Based Instructional Research Laboratory; and the High Ability and Inquiry Research Group concerned with giftedness, creativity, and the role of inquiry in teaching and learning. Students considering participation in the activities of any Centre or research group should contact the researchers responsible, their own program director or advisor about eligibility, types of available involvement, and any registration requirements.

26.3 Admission Requirements

Specific admission requirements vary across degrees and program options. Please see additional details with each detailed description below.

26.4 Application Procedure

All applicants must supply:

1. A completed application form.
2. Official transcripts of post-secondary studies.
3. Letters of reference.
4. Application fee ($60 Canadian – cheque or money order only, payable to "McGill University").
5. TOEFL score (where applicable).

Additional specific requirements apply to particular degrees and program options. Please see additional details with each detailed description below.

Applications including the fee should be addressed to the Program Coordinator (Secretary) at the above address, clearly stating the Degree (M.Ed., M.A. with or without thesis, or Ph.D.) and specialization of interest.

The deadline for applications is February 1 for Summer and September admission. Some programs will consider other admission dates — please consult the Program Coordinator (Secretary) beforehand if applying after February 1. Late applications in some programs may be considered if places have not been filled. The September starting date is normally firm in accredited professional programs.

26.5 Program Requirements

26.5.1 Graduate Degrees in Counselling Psychology – M.A.(non-thesis), M.A., Ph.D.

(see page 154 for graduate degrees in Educational Psychology)

M.A.(non-thesis) COUNSELLING PSYCHOLOGY

The aim of the M.A.(non-thesis) in Counselling Psychology is to produce graduates who (a) are trained in the major academic and applied areas of Counselling Psychology; (b) will be qualified to be counsellors in a variety of settings that require educational, vocational, personal, and developmental counselling; (c) have a knowledge of counselling in both the academic and applied aspects, and (d) who have an extensive supervised internship in either a clinical or educational setting. This program also qualifies graduates to apply to the Ph.D. in Counselling Psychology.

Admission Requirements

1. Applicants must hold **either**
   A. an Honours or Major degree (minimum 54 credits) in psychology, with a CGPA of 3.0 out of 4.0 or better; or
   B. a Baccalaureate degree in a field other than psychology, with a CGPA of 3.0 out of 4.0 or better, and sufficient academic preparation to meet the following requirements:
      (a) a minimum of 36 credits (substantive as distinguished from experiential content) in psychology which includes courses in theories of personality, history and systems of psychology, abnormal psychology, social psychology, inferential statistics, and developmental psychology,
      (b) a minimum of 18 credits in related disciplines in the social sciences, and
      (c) a CGPA of 3.0 out of 4.0 or better in those courses which constitute the 54-credit requirement referred to in (a) and (b) above.
2. In addition to having a record of high scholastic achievement, each applicant must demonstrate adequate performance on the general as well as the psychology components of the Graduate Record Exam (GRE).
3. Normally, preference will be given to applicants having related work experience in public mental health or educational settings.
4. Three (3) letters of recommendation.
5. Additional forms must be filed for admission to the program and may be obtained from the Program Coordinator (Secretary) (514) 398-4244. Applicants must provide an unofficial academic transcript before application to the program.
6. An interview with the Program Director or other faculty members may be required.

Program Requirements

This degree requires two years (four semesters) and one summer term of full-time study. All students must also attend weekly case conferences.

M.A.(non-thesis) Counselling Psychology (60 credits)

Required Courses (30 credits)

412-606	(3)	Theories of Counselling I
412-607	(3)	Theories of Counselling II
412-608	(3)	Group Counselling: Theory
412-609	(3)	Psychological Testing I
412-615	(3)	Assessment and Diagnosis in Counselling
412-618	(3)	Professional Ethics and the Law
412-624	(3)	Group Counselling: Practice
412-662	(3)	Career Psychology
412-665	(6)	Practicum in Counselling

Internship – Required (24 credits)
Two internship components reflect the general counselling nature of the internship and two others reflect specific dimensions of the profession. Completion of the internship is essential to becoming a member of the OPCCOQ.

412-679	(6)	Internship General I
412-680	(6)	Internship Research Seminar
412-682	(6)	Practicum in Psychological Testing
412-685	(6)	Internship in Vocational and Rehabilitation Counselling

Elective Courses (6 credits)
The following courses may be offered periodically and taken to complete or exceed the academic requirements. Electives may also be chosen from other courses offered by the Department or other departments of the University. Choice of electives requires approval of the student's faculty advisor.

412-616	(3)	Individual Reading
412-630	(3)	Feminism, Women and Psychology
412-635	(3)	Counselling for Sexual Adjustment
412-636	(3)	Theories of Sex Therapy
416-617	(3)	Adolescent Development
412-660	(3)	Selected Topics in Counselling
412-670	(3)	Current Trends in Counselling

M.A. COUNSELLING PSYCHOLOGY

Admission to this thesis program is limited.

The aim of the M.A. is to produce graduates who (a) are trained in the major academic areas of Counselling Psychology; (b) have sufficient research ability to evaluate research in counselling; (c) are able to design, conduct and interpret empirical research, and (d) can apply research methods in counselling to common problems and concerns in educational and clinical settings. This program is designed to prepare graduates for research and teaching in the field of Counselling Psychology and to give them the foundation for doctoral studies that have an emphasis on research. This degree does not fulfil the requirements for membership in either the Quebec Professional Order of Guidance Coun-

sellors (OPCCOQ) or Quebec Order of Psychologists (OPQ) or for acceptance into the McGill Ph.D. in Counselling Psychology.

Graduates of the M.A. program will also need a supplementary internship experience if they wish to fulfil the requirements for membership in the Professional Order of Guidance Counsellors of Quebec (OPCCOQ). This will require an additional year of fieldwork experience. M.A. students are admitted to an internship/fieldwork only with approval of the program staff and if supervisory staff is available.

Admission Requirements
Same as for the M.A.(non-thesis) Counselling Psychology.

Program Requirements

Credit for the thesis will be awarded upon satisfactory completion of the thesis components listed below. This degree requires a minimum of 4 semesters and one summer session of full-time study.

M.A. Counselling Psychology (48 credits)

Required Courses (21 credits)

412-606	(3)	Theories of Counselling I
412-607	(3)	Theories of Counselling II
412-608	(3)	Group Counselling: Theory
412-609	(3)	Psychological Testing I
412-662	(3)	Career Psychology
412-665	(6)	Practicum in Counselling

Thesis Component – Required (24 credits)

412-697	(6)	Thesis Preparation I
412-698	(6)	Thesis Preparation II
412-699	(12)	Thesis Preparation III

Elective Course (3 credits)

Ph.D. IN COUNSELLING PSYCHOLOGY

This program is built on the scientist-practitioner model and is accredited by the Canadian and American Psychological Associations. Its aims are:

1. To develop professionals who are able to contribute to the advancement of knowledge in the field of counselling psychology through research that studies social phenomena that may impinge upon the practice of psychology. This research may be a study of the practice of counselling psychology or it may be broader that has indirect implications for practice.
2, To develop professionals who are able to evaluate the merits and weaknesses of current research in the field and its implications for the practice of counselling psychology.
3. To develop professionals who are able to integrate a broad theoretical and practical knowledge base into the practice and supervision of counselling psychology, that is, to train professionals capable of addressing complex issues and applying that understanding to practice and supervision.
4. To develop professionals who are able to take a leadership role in the profession at a variety of levels including community, university and professional organizational levels.

Graduates of the program will be prepared to assume careers in education and community settings, including faculty positions, counselling and psychological positions on the staff of university and college mental health centers, and professional positions in psychological agencies offering preventative mental health services.

Admission Requirements

1. All Ph.D. applicants must have secured in writing a research supervision commitment from one of the Counselling Psychology staff members prior to candidacy.
2. Each applicant, in addition to having a Master's degree in Counselling Psychology or its equivalent, must present evidence of research capability such as a Master's thesis, an Honours thesis or, at the minimum, a well-developed proposal for a doctoral thesis.
3. All applicants must have completed a Master's level internship, otherwise, they must additionally do a more intensive pre-doctoral practicum during their doctoral studies and prior to their pre-doctoral internship.
4. Each applicant is required to take the Graduate Record Examination (General and Psychology Tests).
5. Three (3) letters of reference.

Ph.D. in Counselling Psychology

Required Courses, Comprehensive Examination, and Internship (84 credits)

411-692	(3)	Qualitative Research Methods
412-709	(3)	Advanced Theories and Models
412-714	(3)	Models of Family Therapy
412-719	(3)	Advanced Small Group Counselling
412-720	(6)	Seminar Vocational Psychology and Career Development Theory
412-780	(6)	Professional Development
412-782	(6)	Doctoral Field Practicum
412-786	(6)	Seminar: Research Problems in Counselling
416-622	(3)	Multiculturalism and Gender
416-627	(3)	Professional Practice of Psychology
416-676	(3)	Intermediate Statistics II
416-682	(3)	General Model for Univariate Analysis
416-684	(3)	Methods of Multivariate Analysis
416-712	(3)	Neurological Bases of Behavior
412-701		Comprehensive Examination

Complementary Courses (6 credits)

416-616	(3)	Cognitive Development
(or an equivalent course)		
416-617	(3)	Adolescent Development
or 416-623	(3)	Social-Emotional Development

Internship – Required (24 credits)

412-795	(24)	Supervised Fieldwork in Counselling (Internships)

Other Requirements

Most applicants to the Ph.D. enter with previous supervised fieldwork and with considerable educational and clinical counselling experience. Candidates must coordinate with their academic supervisors an appropriate setting for their fieldwork (pre-doctoral practicum and internship) before entering the formal studies of the program. All students attend weekly case conferences.

A minimum of two years full-time study is required following the Master's degree. Three or four are commonly required.

26.5.2 Graduate Certificate in Counselling Applied to Teaching (15 credits)

The goal of this program is to enhance teachers' knowledge and skills in interpersonal relations, communication, interviewing, group organization and leadership, crisis intervention, and career thinking and planning. In each of these knowledge areas it addresses the recognition of situations when it is appropriate to make a referral to a personal or career counsellor, psychologist, or other professional. The program addresses both elementary and secondary education.

This graduate certificate does not qualify graduates to practice professional counselling or psychology (e.g., conducting psychological assessments or psychotherapy), or to refer to themselves by the term Counsellor or Psychologist: these are legally reserved titles. Programs leading to licensing as Counsellor or Psychologist are presented under Educational and Counselling Psychology (Counselling Psychology and School/Applied Child Psychology) or Psychology (Clinical Psychology).

Admission Requirements

1. An undergraduate degree with a CGPA of at least 3.0 out of 4.0 (some courses will be taken concurrently with Diploma and graduate students, therefore students must have demonstrated equivalent levels of accomplishment in their undergraduate studies).
2. Certification as a teacher, a current teaching or student services position in a school or community organization serving children and adolescents, or other justification for admission to

the program (in all cases the program reserves final discretion about the appropriateness of an alternative qualifications to a teaching certificate).

3. A 3-5 page statement of experience in working with children and adolescents, career aspirations, and reasons for seeking admission to this program.
4. At least two letters of recommendation addressing academic ability, qualifications for working with children and adolescents in a helping role, and general character.
5. TOEFL minimum score of 577 on the paper-based test (233 on the computer based-test) for non-Canadian students from countries where English is not the first language and who have not completed a recognized university degree taught in English.
6. The Department reserves the right to request an interview of any applicant.

Program Requirements

Required Course (3 credits)
412-542 (3) Counselling Role of the Teacher

Complementary Courses (12 credits)
chosen from among the following:
412-501 (3) Helping Relationships
412-502 (3) Group Processes and Individuals
412-504 (3) Practicum in Interviewing Skills
412-505 (3) Crisis Intervention Processes
412-507 (3) Practicum in Group Leadership
412-562 (3) Career Education and Guidance
414-543 (3) Family, School and Community

26.5.3 Graduate Degrees in Educational Psychology – M.Ed., M.A. (Non-thesis), M.A., Ph.D.

(see page 152 for graduate degrees in Counselling Psychology)

M.Ed. EDUCATIONAL PSYCHOLOGY

The aim of the M.Ed. is to offer educators advanced professional training in areas where educational psychology can make a practical contribution to teaching, such as (a) the application of the results of educational research, (b) evaluation of student learning, teaching, programs, and educational experimentation and innovation, (c) a greater understanding of human development, individual differences, and the learning process, and (d) a greater understanding of classroom processes and strategies for teaching diverse learners. Courses will be offered at times that enable part-time study. The program is directed toward the innovative teacher at any level. Applicants may choose the general program or one of several concentrations.

The program offers six M.Ed. areas of concentration of studies:
(a) Adult Education (admission to this concentration has been suspended),
(b) Computer Applications,
(c) Education of the Gifted,
(d) Family Life Education,
(e) General Educational Psychology,
(f) Inclusive Education.

Students may design their studies around the Major/Minor areas outlined under the Ph.D. listings. This is especially recommended for students contemplating an application to the Ph.D. (Educational Psychology) following the M.Ed.

Admission Requirements

1. An undergraduate degree in Education, Psychology, or another field relevant to the proposed studies in Educational Psychology.
2. CGPA of 3.0 out of 4.0 or higher in undergraduate studies.
3. Statements of academic and research experience, relevant professional training and experience.
4. Letters of reference from at least two professional colleagues, or from at least two former university instructors, and any others the applicant wishes should be submitted.

Program Requirements

The program contains three main parts: (a) 3 required courses (9 credits), (b) two required courses (12 credits) constituting a Special Activity, the student's major project intended to demonstrate by performance that the student has succeeded in the program – the Special Activity may be one large project or two smaller ones, and (c) optional courses, totalling 27 credits that allow the student to design an individualized program or specialize in one or more areas of concentration.

Some courses are offered in alternating years. Students should take 416-602 early in their program. Pre- or corequisite to 416-602: 416-575 Educational Measurement or its equivalent; this course may be included as an elective within the 48 credits of the M.Ed. and should be taken first. The program director or advisor for the M.Ed. area of concentration should be consulted about the specific sequence to be followed

Required Courses (21 credits)
416-602 (3) Uses of Research Findings in Education
416-603 (3) Educational Research and Development for Practitioners
416-635* (3) Theories of Learning and Instruction
416-697 (6) Special Activity I
416-698** (6) Special Activity II
* Inclusive Education and Family Life Education students may replace 416-635 with 416-636 or take both
** Inclusive Education students may replace 416-698 with 414-656

Elective Courses (27 credits)
Optional courses may be selected in consultation with the Program Director for the M.Ed. area of concentration from among the Department's graduate courses and from other courses offered at the graduate level in the University. Optional courses are selected so as to provide students with a coherent program of study in their area of interest and tailored to their needs.

M.Ed. Concentrations

Students may select these as part of their 27 credits of elective courses. Some courses also have prerequisites or corequisites that should be heeded in program planning. Students are welcome to propose to their faculty advisors or the Associate Program Director adaptations of these M.Ed. Concentrations. Completion of the Family Life Education Concentration as described is essential for recognition by the accrediting body.

(a) Adult Education
(Admission to this concentration has been suspended)

The M.Ed. Concentration in Adult Education is offered in collaboration with the Department of Integrated Studies in Education. The program especially addresses professional education and its links with studies in higher education, instructional psychology, and applied cognitive science.

450-610 (3) Foundations of Adult Education
450-612 (3) The Adult Learner
450-614 (3) Teaching the Adult

(b) Computer Applications in Education

15 credits from among the following:
416-640 (3) Research in Computer Applications
416-641 (6) Use of the Computer in Educational Instruction
416-643 (3) Evaluation of Computer Software and Hardware
416-650 (3) Consciousness and Virtual Reality
416-660 (3) Artificial Intelligence and Education

(c) Education of the Gifted

414-526 (3) Talented and Gifted Students
414-536 (3) Practicum in the Education of the Gifted

plus 3 credits from the following:
414-527 (3) Creativity and its Cultivation
414-537 (3) Practicum in the Education of the Gifted II
414-628 (3) Gifted Students with Special Needs

(d) Family Life Education

416-640 (3) The Foundation of Family Life Education

plus 15 credits from the following:

412-501 (3) Helping Relationships
412-502 (3) Group Processes and Individuals
412-503 (3) Human Sexuality for Professionals
412-504 (3) Practicum in Interviewing Skills
412-505 (3) Crisis Intervention Processes
412-507 (3) Practicum in Group Leadership Skills
412-508 (3) Seminar in Special Topics
412-509 (3) Individual Reading Course
412-510 (3) Family Life Education and Marriage
416-560 (3) Human Development
416-564 (3) Family Communication
416-565 (3) Psychosocial Aspects of Cancer
416-595 (3) Seminar in Special Topics

(e) General Educational Psychology

The program is designed individually by the student in consultation with the student's faculty advisor or Associate Program Director.

(f) Inclusive Education

The following pattern is recommended for students without previous background in inclusive education. With the advice of the student's faculty advisor, the program will be adapted to address students' academic and professional interests and needs.

414-642 (3) Education of Learners with Special Needs I: Overview
414-643 (3) Education of Learners with Special Needs II: Issues
414-645 (3) Diagnosis and Assessment in Special Education
414-654 (3) Instruction/Curriculum Design and Adaptation
414-665 (3) Research & Theory in Learning Disabilities
414-667 (3) Behavioral and Emotional Problems
414-680 (3) Selected Topics in Special Education (I)
414-526 (3) Talented and Gifted Students

Since 1997 the Quebec Ministry of Education no longer issues specialist certificates except in initial teacher education. Specialized certificates are not required to seek employment, but school boards will still seek suitably qualified applicants for teaching and consulting positions.

PRE-DOCTORAL STUDIES

M.Ed. students and graduates are eligible to apply to the Ph.D. in Educational Psychology if they have completed the following program elements. These may have been included within the M.Ed. program. Upon completion of the M.Ed., if the uncompleted requirements can be accomplished in one year of study or less, they may be taken in the Ph.D. 1 year. Any excess must be completed before Ph.D. studies can begin. The required elements are:

- studies within a Major area to be pursued within the Ph.D. (there is no required number of courses since Major sequences are calculated across Master's and Ph.D. studies),
- the following general courses: (a) 416-602, (b) 416-603 (research methods) or 411-692, 431-630 or the equivalent (qualitative research methods), and (c) 416-676 (intermediate statistics – 416-675 is not presently offered since 416-575 now prepares students to proceed directly to 416-676).
- a research project in the manner of an M.A. thesis (though less extensive) within at least one of the Special Activities (416-697 or 416-698).

In the Ph.D. 1 year for M.Ed. (Educational Psychology) graduates, students will normally complete any remaining Ph.D. required courses listed below, continue study in their Major and Minor sequences, and actively begin their doctoral research. The courses referred to are:

416-600 (3) Seminar in Educational Psychology
416-682 (3) General Models for Univariate Analysis
and, optionally,
416-684 (3) Methods of Multivariate Analysis.

All three courses may be taken as options within the M.Ed.

M.Ed. students who contemplate continuing to a Ph.D. (Educational Psychology) Major in the Cognition and Instruction Program Grouping should take 416-666 and, in addition, take 416-555 which may supplement or replace 416-600.

M.A. (NON-THESIS) EDUCATIONAL PSYCHOLOGY

The M.A. (Non-thesis) in Educational Psychology is available only to students admitted to the study sequence leading to the Ph.D. in Educational Psychology (Major in School/Applied Child Psychology). The M.A. is normally awarded after completion of the first two years of the five-year Ph.D., including the School Psychology Research Project.

Admission Requirements

1. Major or Honours B.A. or B.Sc. in Psychology or a B.Ps. including courses in developmental, abnormal, and cognitive psychology, history and systems in psychology, statistics; and results of the Graduate Record Examination (Verbal, Quantitative, and Psychology).
2. GREs should be taken no later than December.
3. A three-page research proposal is required of students applying for entrance with advanced standing.

Program Requirements

Detailed program requirements for the full five-year program are listed below under the Ph.D. Major in School/Applied Child Psychology.

M.A. Educational Psychology (48 credits –
or 78 credits for School/Applied Child Psychology)

The aim of the M.A. (with thesis) is to produce graduates who (a) are broadly trained in educational psychology, (b)have sufficient research competence to critically evaluate research in educational psychology, and to design, conduct and report empirical research, and (c) have experience in applying research methods and findings to the solution of practical problems in varied educational settings.

Admission and Program Requirements vary among program areas that correspond to Ph.D. Majors described below:

Cognition and Instruction Program Area, including
Applied Cognitive Science,
Computer Applications in Education,
Higher Education,
Instructional Psychology.

Admission Requirements

1. An undergraduate degree in Education, Psychology, or another field relevant to the proposed studies in Educational Psychology. It is recommended that some prior study of a relevant branch of psychology form part of the undergraduate training.
2. CGPA of 3.0 out of 4.0 or higher in undergraduate studies.
3. Statements of academic and research experience, relevant professional training and experience.

Program Requirements

Candidates are required to follow an approved course of study, to select a topic for research, and to present the results of such research in the form of an acceptable thesis. Required courses ensure that each graduate will emerge with substantive knowledge of the content and methods used in educational psychology. Optional courses provide an opportunity for qualified candidates to study advanced topics related to their research and to diversify their knowledge of the discipline.

Required Courses (9 credits)

416-605 (3) Research Methods
416-676 (3) Intermediate Statistics II
416-682 (3) General Model for Univariate Analysis

Thesis Component – Required (24 credits)
416-604 (3) Thesis I
416-607 (3) Thesis II
416-693 (3) Thesis III
416-694 (3) Thesis IV
416-695 (6) Thesis V
416-696 (6) Thesis VI

Complementary Courses (15 credits)
one of:
416-600 (3) Seminar in Educational Psychology
or 416-555 (3) Applied Cognitive Science

and 12 credits to be chosen by students with the approval of their supervisors and the program director. The courses must come from at least two different Major or Minor Ph.D. sequences or other courses in those areas. Courses may be applied toward Ph.D. (Educational Psychology) Major and Minor requirements.

It is generally recommended that students make their choices from among the courses required for the Ph.D. Major or Minor sequences or the M.Ed. Concentration in their areas of primary interest. These are enumerated below.

Students intending to proceed to the Ph.D. Majors in Applied Cognitive Science or Instructional Psychology take courses for which 416-555 Applied Cognitive Science or the equivalent is a prerequisite. Students may take both 416-555 and 416-600 among their complementary courses.

26.5.4 Professional Psychology Program Grouping – M.A. (Non-thesis), M.A., Ph.D.

M.A. EDUCATIONAL PSYCHOLOGY

The M.A. in Educational Psychology with thesis in this program grouping is available in two specializations, Applied Developmental Psychology (48 credits) and School/Applied Child Psychology (78 credits). In the latter case, students must begin in the M.A. (non-thesis) and may request to transfer at the end of the first semester or thereafter.

Admission Requirements

Same as for the M.A. (non-thesis) specialization in School/Applied Child Psychology.

Program Requirements

Candidates are required to follow an approved course of study, to select a topic for research, and to present the results of such research in the form of an acceptable thesis. Required courses ensure that each graduate will emerge with substantive knowledge of the content and methods used in educational psychology. Optional courses provide an opportunity for qualified candidates to study advanced topics related to their research and to diversify their knowledge of the discipline.

Required Courses (12 credits)
Applied Developmental Psychology and School/Applied Child Psychology:
416-600 (3) Seminar in Educational Psychology
416-605 (3) Research Methods
416-676 (3) Intermediate Statistics II
416-682 (3) General Model for Univariate Analysis

Thesis Component – Required (24 credits)
Applied Developmental Psychology:
416-604 (3) Thesis I
416-607 (3) Thesis II
416-693 (3) Thesis III
416-694 (3) Thesis IV
416-695 (6) Thesis V
416-696 (6) Thesis VI

Students in School/Applied Child Psychology who may wish to do an M.A. (with thesis) should consult the Program Director regarding additional requirements.

Complementary Courses (12 credits)
To be chosen by students with the approval of their supervisors and the Program Director. The courses must come from at least two different Major and Minor sequences or other courses in those areas. Courses may be applied toward Ph.D. (Educational Psychology) Major and Minor requirements.

For students in School/Applied Child Psychology there are no complementary courses. All courses taken at the M.A. level are prescribed within the M.A./Ph.D. sequence described below and the total at the M.A. level, including thesis, is 78 credits.

Ph.D. EDUCATIONAL PSYCHOLOGY

Professional Education Program Area, including
Inclusive Education,
Family Life Education,
Gifted Education,
General Educational Psychology.

The aim of the Ph.D. is to produce graduates who are competent in planning and implementing basic and applied research on problems of cognition; teaching and learning, and development, applying research methods to the solution of educational problems and the improvement of educational practices. It prepares graduates to work as psychologists, consultants, and program directors in schools or related educational institutions, and for teaching educational psychology at the university level. Opportunities are provided for advanced study, research, clinical practice, practica and internships experience in the application of research.

Admission Requirements

All doctoral students must have a research advisor upon entry to the program. Interested candidates should contact the program coordinator (secretary) for a faculty list or consult the Department Web page. An advisor may be selected from among professors in the Department. It is essential to clearly state the Major. It is helpful to identify the Minor as well.

Students in School/Applied Child Psychology are automatically considered to elect Applied Developmental Psychology as their Minor, but may also add another Minor in some circumstances.

There are two entry levels and patterns:
starting at Ph.D .2
starting at Ph.D .1

The specific requirements to be admitted at each level are as follows:

Ph.D. 2 level
(a) Applicants should hold an M.A. in Educational Psychology from McGill or a recognized equivalent degree, reflecting high overall standing, study within the area of proposed doctoral specialization, and evidence of research competence.

or

(b) Applicants should have completed the first year in the Department's M.A. program, with high academic standing in coursework, including study within the area of proposed doctoral specialization, and the completion of a research project supervised by a faculty member.

Ph.D. 1 level
(a) Applicants should hold an M.Ed. in Educational Psychology or a Master's degree in a related discipline (e.g., sociology, social work) lacking only the content in educational psychology that can be acquired within one year of full-time study. The applicant's academic record must reflect high overall standing and evidence of research competence.

or

(b) Applicants should hold a Bachelor's degree in psychology, reflecting high academic standing in an Honours or Major program, and have completed an undergraduate thesis or the equivalent. (This option is rarely exercised.)

All applicants will also be expected to provide:
1. at least two letters of recommendation,
2. a 3-5-page summary proposal of the intended thesis research,
3. a statement of experience, career plans, and program appropriateness, and
4. a copy of a Master's thesis, Honours thesis, or research project (which will be returned after examination).

Additional Entrance Notes:

School/Applied Child Psychology
Applicants are required to supply results of the Graduate Record Examinations (Verbal, Quantitative, and Psychology) at the time of initial application. An undergraduate Major or Honours degree in Psychology is required including courses in developmental, abnormal and cognitive psychology, history and systems in psychology, and statistics. McGill Psychology graduates completing the 36-credit B.A. Major Concentration must complete at least 18 additional credits of senior undergraduate study in psychology or related subjects.

Students will enrol for two years in the M.A. (Non-thesis) in Educational Psychology, and will follow the course sequence noted below. At the end of the first semester or thereafter students may request to change to the M.A. with thesis if supervision is available. Students will receive the M.A. following the second year having completed all the requirements and to proceed directly to Ph.D. 2 in their third year of study unless advised after the third M.A. semester that they are not maintaining a sufficiently high standard to continue to the Ph.D. Such students may elect to complete the M.A. or withdraw.

Applied Developmental Psychology
Applications to the Ph.D. are normally only accepted from the thesis M.A. to Ph.D. route (see the M.A. in Educational Psychology). Other entrance requirements are the same as for School/Applied Child Psychology.

Applicants with exceptional strength in academic studies who do not meet the above requirements may apply for admission to the doctoral program. Such students may be required to complete a qualifying year or term prior to applying for Ph.D. admission.

Program Requirements

All students are required to elect and follow a Major and a Minor sequence. Students who are making satisfactory progress in their studies may be permitted to fulfil the requirements of a second Minor within the programs. Courses from Major and Minor sequences taken during M.A. and M.Ed. studies are counted toward the total. A Major consists of five courses (15 credits), except in School/Applied Child Psychology, and a Minor consists of three courses (9 credits). Each Major and Minor is specified below and the degree of choice of courses within each is indicated separately.

Candidates admitted into Ph.D. 2 are required to complete a minimum of two full years of study. Candidates admitted into Ph.D. 1 are required to complete a minimum of three full years of study.

A dissertation must be submitted displaying original scholarship expressed in satisfactory literary form and constituting a distinct contribution to knowledge on a problem in educational psychology. Work on the thesis normally begins in the Ph.D. 2 year and becomes the major concern in the Ph.D. 3 year of a student's program of study.

Each student will be supervised by an advisor who will chair the student's doctoral committee. This committee will have a minimum of three members. It will assist the student and advisor in planning the student's program. It will also be consulted in the nomination of external examiners for the thesis.

Ph.D. Core Courses

These requirements apply to all Majors and except for 416-708 (Comprehensive Examination) they may partly or wholly be completed in the M.A. or M.Ed.

Students may replace any course for which they have equivalent background, subject to approval by the Program Director.

Required Courses and Comprehensive Examination
449-689 (3) Teaching and Learning
416-605 (3) Research Methods
416-676 (3) Intermediate Statistics II
416-682 (3) General Model for Univariate Analysis
416-708 Comprehensive Examination

Complementary Courses (6 credits)
Students in Applied Cognitive Sciences choose one of:
416-600 (3) Seminar in Educational Psychology
or 416-555 (3) Applied Cognitive Psychology
and 3 credits chosen from:
416-684 (3) Methods of Multivariate Analysis
or 411-692 (3) Qualitative Research Methods
or 431-630 (3) Qualitative and Ethnographic Studies
or the equivalent

Language Requirement

Students are not required to demonstrate knowledge of a second language within this program, but anyone wishing to be licensed as a psychologist in Quebec must at that point demonstrate a working knowledge of French. Appropriate courses are available at McGill.

Major Sequences in the Ph.D.(Educational Psychology)

(a) Applied Cognitive Science

Research on the cognitive processes and knowledge structures that underlie learning, competence and performance in educationally significant domains and populations of learners; applied research employing the theories, methods and findings of the cognitive sciences to the analysis of cognitive processes underlying performance in instructional tasks including: reading comprehension, written composition and other literacy skills; computation, mathematical problem solving and other mathematical skills; learning and the acquisition of knowledge and skill in other content domains of school learning and cognitive processes, including differences between novices and experts, and comparative studies of different populations of learners; applications of cognitive analyses of school learning and performance to the improvement of learning and instruction and the diagnosis and remediation of learning difficulties.

Required Courses (6 credits)
416-666 (3) Cognition and Instruction (to be taken first)
416-656 (3) Applied Cognitive Theory/Methods

Complementary Courses (9 credits)
9 credits to be chosen from:
416-655 (3) Cognitive Science and Education
416-661 (3) Discourse Processes and Education
416-662 (3) Psycholinguistics and Learning
416-663 (3) Learning in Complex Situations
416-664 (3) Nature/Development of Expertise
416-665 (3) Reasoning and Problem Solving
416-668 (3) Seminar: Applied Cognitive Science

(b) Applied Developmental Psychology

Child and adolescent development including cognitive, language, social issues, and personality development, and gender issues in relation to processes of learning, problems and practices of education, child rearing and family influences, and social interaction in varied educational settings; developmental theories, developmental psychopathology and social policy issues.

Required Courses (9 credits)
416-615 (3) Theory/Issues in Child Development
416-616 (3) Cognitive Development
416-623 (3) Social Emotional Development

Complementary Courses (6 credits)
6 credits from the following, which may be offered in rotation:
416-515(3) Gender Identity Development
416-610(3) History/Development Psychology
416-620(3) Developmental Psychopathology
416-622(3) Psycholinguistics & Learning
416-628(3) Seminar in Applied Developmental Psychology

(c) Instructional Psychology

Research on cognitive processes applied to instruction and learning in classrooms and other instructional situations at all levels of education including higher education, adult and professional education; applied research on the design of effective instructional

environments including educational applications of computers; application of research methods, models and results in evaluating and improving the capacity of classrooms and other instructional environments to support high levels of educational accomplishment in learners with varied backgrounds of knowledge, ability and experience.

Required Courses (15 credits)
416-666 (3) Cognition and Instruction (to be taken first)
416-535 (3) Instructional Design
416-635 (3) Theories of Learning and Instruction
416-645 (3) Research on Instructional Processes
416-648 (3) Instructional Psychology Seminar (to be taken near the end)

Complementary Courses (6 credits)
416-670 (3) Educational Evaluation
416-687 (3) Advanced Qualitative Methods

(d) School/Applied Child Psychology

This program is constructed according to the scientist-practitioner model. Child and adolescent problems faced by practicing school and child psychologists. Research on the educational impact of intellectual deficits, emotional disorders, pervasive developmental disorders, abuse, social-effective and cognitive development, high risk indices, and psychological assessment in school and educationally related settings. Development psychopathology and therapeutic interventions and techniques, coordination of psychological and pedagogical services in educational settings. This is a 96-credit, five-year fixed major that includes the M.A.

Required Courses (60 credits)
412-609 (3) Psychological Testing I
412-610 (3) Psychological Testing II
412-618 (3) Professional Ethics and the Law
412-682 (6) Practicum in Psychological Testing
412-714 (3) Models of Family Therapy
414-654 (3) Instruction/Curriculum Adaptation
416-611 (3) School Psychology Seminar
416-616 (3) Cognitive Development
416-619 (3) Child and Adolescent Therapy
416-620 (3) Developmental Psychopathology
416-622 (3) Multiculturalism and Gender
416-623 (3) Social-Emotional Development
416-625 (3) Practicum I in School Psychology
416-626 (3) Practicum II in School Psychology
416-627 (3) Professional Practice of Psychology
416-629 (6) School Psychology Research Project
416-710 (3) Consultation in School Psychology
416-712 (3) Neurological Bases of Behavior

Students who transfer from the Non-thesis to the Thesis option will replace 416-629 (6 credits) with 416-604, 416-607, and 416-693 to 416-696 (total 24 credits). Electing the Thesis option will, therefore, add 18 credits to the 60 required in the Non-thesis option for a total of 78 credits.

Complementary Courses (12 credits)
Students must select 2 of these 3 practicum settings:
416-721 (6) School Psychology: Elementary
416-722 (6) School Psychology: Secondary
416-723 (6) School Psychology: Community
Placement in a school covering all grades may be applied to either 416-721 or 416-722.

Internship (24 credits)
416-725 (12) Internship I in School Psychology
416-726 (12) Internship II in School Psychology

(e) Special Populations of Learners
Focus on research and teaching of special groups of students, including gifted and creative students, and special needs children and adolescents. In the area of special needs students, the focus is on inclusive settings. Theoretical models, intervention strategies, and systems change are explored.

Students will normally follow the M.Ed. (rather than the M.A.) prior to the Ph.D. They should therefore make the following course substitutions and additions:

- 416-603 instead of 416-605,
- 431-630 or equivalent, instead of the alternative 416-684,
- and 416-676, if not already taken.

M.A. students will require 416-635 as an additional course.

Special Populations of Learners/Special Needs Option
414-643 (3) Education of Learners with Special Needs II: Issues
414-743 (3) Seminar on Special Needs
414-756 (3) Internship in Special Needs Education
and 6 credits from the courses offered in the M.Ed. Inclusive Education Concentration with the approval of the student's thesis supervisor and the Program Director.

Special Populations of Learners/Gifted Education Option
414-526 (3) Talented and Gifted Students
416-535 (3) Instructional Design
414-636 (3) Curriculum in Gifted Education
416-670 (3) Educational Evaluation
or 416-671 (3) Educational Evaluation: Theory and Practice
and one of the following, which may be offered in rotation:
414-527 (3) Creativity and its Cultivation
414-628 (3) Gifted Students with Special Needs
416-636 (3) Classroom Processes and Social Psychology

In addition, one of the Special Activities (416-697 or 416-698) (6 credits each) must consist of the content of 416-536 and 414-537, Practicum in the Education of the Gifted I and II (3 credits each). Students may register either for the Practica or Special Activity.

Minor Sequences in the Ph.D.(Educational Psychology)

(a) Adult Education
(Admission to this minor sequence has been suspended.)

The Ph.D. Minor sequence in Adult Education is offered in collaboration with the Department of Integrated Studies in Education. The program especially addresses professional education and its links with studies in higher education, instructional psychology, and applied cognitive science.

Required Courses (9 credits)
450-610 (3) Foundations of Adult Education
450-612 (3) The Adult Learner
450-614 (3) Teaching the Adult

(b) Applied Cognitive Science

Complementary Courses (9 credits)
6 credits chosen from:
416-555 (3) Applied Cognitive Psychology
416-655 (3) Cognitive Science and Education
416-656 (3) Applied Cognitive Theory/Methods
416-666 (3) Cognition and Instruction
3 credits chosen from:
416-661 (3) Discourse Process and Education
416-662 (3) Psycholinguistics and Learning
416-663 (3) Learning in Complex Situations
416-664 (3) Nature/Development of Expertise
416-665 (3) Reasoning and Problem Solving
416-668 (3) Seminar in Applied Cognitive Psychology

(c) Applied Developmental Psychology

416-615 (3) Theory/Issues in Child Development
416-616 (3) Cognitive Development
416-623 (3) Social and Emotional Development

(d) Computer Applications in Education

Complementary Courses (9 credits)
9 credits chosen from:
416-640 (3) Research in Computer Applications
416-641 (6) Use of the Computer in Educational Instruction
416-643 (3) Evaluation of Computer Software and Hardware
416-650 (3) Consciousness and Virtual Reality
416-660 (3) Artificial Intelligence and Education

(e) Family Life Education

412-505 (3) Crisis Intervention Processes
412-640 (3) The Foundations of Family Life Education
416-564 (3) Family Communication

(f) Higher Education

Required Courses (9 credits)
449-582 (3) Higher Education Theory/Policy
449-588 (3) The Higher Education Environment
449-681 (3) Higher Education Development

(g) Instructional Psychology

Required Courses (6 credits)
416-666 (3) Cognition and Instruction (to be taken first)
416-648 (3) Instructional Psychology Seminar (to be taken near the end)

Complementary Courses (3 credits)
to be chosen from one of the following:
416-535 (3) Instructional Design
416-635 (3) Theories of Learning and Instruction
416-645 (3) Research on Instructional Processes

(h) Psychology of Gender

416-515 (3) Gender Identity Development (must be completed at the Master's or Ph. D.1 level).
416-624 (3) Educational Psychology and Gender
412-630 (3) Feminism, Women and Psychology

Students selecting the Psychology of Gender Minor are encouraged to take 411-692 or 431-301 or the equivalent (qualitative research methods).

(i) Special Populations of Learners/Special Needs

414-643 (3) Education of Learners with Special Needs II: Issues
414-743 (3) Seminar on Special Needs
and 3 credits from the courses offered in the M.Ed. Inclusive Education Concentration with the approval of the student's thesis supervisor and the Program Director.

(j) Special Populations of Learners/Gifted Education

414-526 (3) Talented and Gifted Students
414-536 (3) Practicum in the Education of the Gifted I
and one of
414-527 (3) Creativity and its Cultivation
414-537 (3) Practicum in the Education of the Gifted II
414-628 (3) Gifted Students with Special Needs

26.5.5 Post-Ph.D. Graduate Diploma in School/Applied Child Psychology

This Post-Ph.D. Graduate Diploma enables holders of a doctorate in Psychology to respecialize in School/Applied Child Psychology. The course of study is adapted to the background of each student. The program includes exceptionally one, or typically two, years of courses and practica, plus a year of internship. Students register on a per-credit basis (including Internship).

Professional Accreditation

All elements of this Post-Ph.D. Graduate Diploma are selected from the professional components of the Ph.D. Educational Psychology Major in School/Applied Child Psychology, which is accredited in the School Psychology category by the American Psychological Association (APA). Graduates of a respecialization program are normally accorded the same recognition as graduates of the accredited program.

The Ph.D. Major has also been approved by the Ordre des psychologues du Québec (OPQ) which has recommended the final stage of professional recognition to the *Office des professions* of the Government of Quebec. Once this accreditation is confirmed, however, graduates of the Post-PhD Graduate Diploma will *not* be automatically eligible for membership in the OPQ and the right to practice professional psychology in Quebec. If it is their ultimate wish to do so, they will be required to apply to the OPQ for the recognition of equivalent qualifications.

Accreditation status may be confirmed by contacting the accrediting bodies:

APA – Committee on Accreditation, 750 First Street NE, Washington, DC, USA 20002-4242
tel. 1-800-374-2721-option 5-local 5974

CPA – 151 Slater Street, Suite 205, Ottawa, ON, Canada K1P 5H3
tel. 1-888-472-0657

OPCCOQ – 1100 Beaumont, Ste. 520, Mt-Royal, QC, Canada H3P 3H5; tel. 514-737-6431

OPQ – 1100 Beaumont, Ste. 510, Mt-Royal, QC, Canada H3P 3H5; tel. 514-738-1881

Admission Requirements

1. An earned doctorate in Educational Psychology, another area of Psychology, or a closely related discipline (to be recognized at the Program Director's discretion).
2. Graduate Record Examination Verbal, Quantitative, and Psychology results taken within 5 years preceding this application.
3. Full transcripts of the student's complete university (and, if applicable, college) education showing all courses in psychology, education, and related disciplines.
4. At least two letters of recommendation addressing both academic record and potential for professional practice in psychology.
5. A statement of experience, career plans, and program appropriateness.
6. A curriculum vitae including all theses or dissertations, publications, and conference presentations, with copies of the title pages and abstracts of any theses or dissertations appended.
7. TOEFL minimum score of 577 on the paper-based test (233 on the computer-based test) for non-Canadian students from countries where English is not the first language and who have not completed a recognized university degree taught in English.

Students may be asked to provide further details in support of any request for a course exemption, e.g., course outlines, examples of work done in the course, or a letter from the instructor or department where the material is claimed to have been covered.

Program Requirements

The program will be individually tailored to each accepted student in respect of previous studies and experience. Students will not be asked to repeat a course on a topic in which they can demonstrate a high level of competence. The following are expected to be most often required of students.

Required Courses and Clinic-based Practica (30 credits)
412-609 (3) Psychological Testing I
412-610 (3) Psychological Testing II
412-618 (3) Professional Ethics and the Law
412-682 (6) Practicum in Psychological Testing
416-619 (3) Child and Adolescent Therapy
416-625 (3) Practicum I in School Psychology
416-626 (3) Practicum II in School Psychology
416-710 (3) Consultation in School Psychology
416-714 (3) Models of Family Therapy

Complementary Courses – Field Placements (12 credits)
(2 days per week, one semester each; students select 2 of these 3 field experiences; placement in a school covering all grades may be applied to either 416-721 or 416-722):
416-721 (6) School Psychology: Elementary
416-722 (6) School Psychology: Secondary
416-723 (6) School Psychology: Community

Internship (24 credits)
(1 year full-time or 2 years half-time)
416-725 (12) Internship I in School Psychology
416-726 (12) Internship II in School Psychology

Please see the description of the Ph.D. Educational Psychology Major in School Applied Child Psychology for the full list of requirements from which each student's Graduate Diploma program will be constructed.

Language Requirement

Students are not required to demonstrate knowledge of a second language within this program, but any student wishing to be licensed as a professional psychologist in Quebec must at that point have a working knowledge of French.

26.6 Courses

Note: Some courses are open only to students in specific programs or concentrations. For specific program applicability consult the program profiles above. Some courses, particularly in psychological assessment, have supplementary lab fees. Details are available from the Program Coordinator (Secretary).

Some courses are offered in alternate years and others only when numbers warrant. Annual lists are available. Please consult the Department before attempting to register.

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

Courses are listed in numerical order, with the 3-digit prefix indicating the areas, as follows:

412 – Counselling Psychology and Family Life Education
Note: 500-level courses are offered through Continuing Education. Please contact the Program Coordinator.
414 – Inclusive Education and Education of the Gifted
416 – Educational Psychology (including all specializations not represented by other prefixes)
432 – Educational Technology (undergraduate)
449 – Higher Education
450 – Adult Education

412-501 HELPING RELATIONSHIPS. (3) (Open to Educational and Counselling Psychology students.) A course in basic principles of human relationships and communication skills, approached from a theoretical and experiential viewpoint. Emphasis will be given to training in basic listening skills, interviewing techniques, and the interpretation of non-verbal behaviour in communication.

412-502 GROUP PROCESSES AND INDIVIDUALS. (3) (Open to Educational and Counselling Psychology students.) A laboratory course in which participants observe individual dynamics within a group setting as well as analyze the developmental phases of the group. Participants will be encouraged to experiment with their own behaviour, in order to increase their own awareness of functioning.

412-503 HUMAN SEXUALITY FOR PROFESSIONALS. (3) (Open to Educational and Counselling Psychology students.) Historical, biological, anthropological, psychological and sociological perspectives of human sexual development. Sexual dysfunctions and approaches to sex therapy will be discussed. Attitudes toward sexuality held by professional helpers will be examined relative to their implications for the learning and teaching of human sexuality and sex therapy.

412-504 PRACTICUM IN INTERVIEWING SKILLS. (3) (Prerequisite: 412-501) (Open to Educational and Counselling Psychology students.) This course will enable students to become practitioners in the field of Applied Social Sciences. Theoretical principles of the helping relationship will be applied in particular situations. Demonstration, lecture, role-playing and psychodrama techniques will be used.

412-505 CRISIS INTERVENTION PROCESSES. (3) (Open to Educational and Counselling Psychology students.) Instruction in the skills of working with crisis situations involving persons emotionally disturbed, suicidal, or alcoholic, and those who are on drugs or experiencing emotional trauma, as well as other problems. Attention will be given to identification of referral sources and the writing of reports.

412-506 ORGANIZATIONAL DEVELOPMENT. (3) (Open to Educational and Counselling Psychology students.) Interrelationships of individuals, groups, and organizational systems. Various models for understanding group and individual functions within an organization. Intervention techniques by the practitioner to effect changes within the organization.

412-507 PRACTICUM IN GROUP LEADERSHIP SKILLS. (3) (Prerequisite: 412-502) (Open to Educational and Counselling Psychology students.) The practical aspects of group leadership, group design and planning. Candidates will set up groups, conduct such groups over a number of sessions, and assess these groups according to the theoretical models covered in the prerequisite course.

412-508 SEMINAR IN SPECIAL TOPICS. (3) (Open to Educational and Counselling Psychology students.) Content will vary from year to year and will be announced prior to registration. The seminar may be given by a single instructor or by a group, as the occasion warrants. Permission must be obtained from the Department before registration.

412-509 INDIVIDUAL READING COURSE. (3) (Open to Educational and Counselling Psychology students.) By arrangement with individual instructor.

412-510 FAMILY LIFE EDUCATION AND MARRIAGE. (3) (Open to Educational and Counselling Psychology students.) The contribution of central concepts of psychological theories and therapeutic systems to the understanding of marriage and relationships. Special attention will be given to gender and ethnicity issues in order to increase the sensitivity of students to the issues typically confronted in the modern marriage and family.

412-542 COUNSELLING ROLE OF TEACHERS. (3) Theory and practice in interpersonal communication, interviewing, group dynamics, group leadership management, and referral criteria and procedures for students with developmental problems who experience trauma or crisis. Addressed primarily to elementary and secondary teachers who combine instructional responsibilities with a supportive role in school guidance and counselling activities.

412-562 CAREER EDUCATION AND GUIDANCE. (3) A review of career education and guidance programs that refer to the subject matter and related methods and techniques designed to foster the intellectual development of career awareness, career planning, career decision-making, and the necessary career-resilient employability skills for the school-to-work transition.

412-606 THEORIES OF COUNSELLING I. (3) An introduction to counselling theories especially as they are related to theories of personality, human development and learning.

412-607 THEORIES OF COUNSELLING II. (3) (Prerequisite: 412-606) A detailed study of phenomenological, developmental and behavioral theories of counselling among others.

412-608 GROUP COUNSELLING: THEORY. (3) Examines the theory and process of group counselling with an emphasis on skills and techniques. Particular attention will be given to the procedural aspects of organizing a group, the theory underlying certain approaches, the process, and evaluation of outcomes.

412-609 PSYCHOLOGICAL TESTING I. (3) (Prerequisite: a basic statistics course.) For Counselling Psychology and School/Applied Child Psychology students. History of psychological testing, theoretical aspects of individual and group testing, basic theories of intelligence, and ethical and legal issues in testing. An introduction to tests of intelligence (particularly the WISC-R), aptitude, personality, and interests, including issues of validity, reliability, and construction.

412-610 PSYCHOLOGICAL TESTING II. (3) (Prerequisite: 412-609) (Required in School/Applied Psychology. Optional in Counselling Psychology, but recommended for students specializing in school or child counselling.) Theory and interpretation of intelligence tests, particularly the Wechsler and Binet scales. Practice in writing test reports, particularly as a part of a case study. The use of intelligence test results in conjunction with other types of tests.

412-615 ASSESSMENT AND DIAGNOSIS IN COUNSELLING. (3) An introduction to differential assessment and diagnosis for counsellors in educational and mental health settings. The clinical interview, the assessment process, the DSM-IV, relevant test instruments, diagnostic procedures, and development of treatment

plans will be subjects of study. Models of record keeping and referral procedures will be reviewed.

412-616 INDIVIDUAL READING. (3) Candidates may, with the consent of the Department, elect this individual reading and conference course in lieu of one of the above courses.

412-618 PROFESSIONAL ETHICS AND THE LAW. (3) (For Counselling Psychology and School/Applied Child Psychology students.) Ethics in the helping professions and some of the philosophical bases for making ethics decisions. Quebec and Canadian law relative to human rights of clients; responsibilities of counselling and school psychologists toward clients and society in general.

412-620 ADVANCED CHILD PSYCHOLOGY. (3) Study of the growing person from birth to pre-adolescence with emphasis on the background and methods as well as research on the principles of child development, disturbances in child development, various areas of development, and characteristics of different age levels.

412-624 GROUP COUNSELLING: PRACTICE. (3) (Prerequisite: 412-608) The practical dimension of planning and designing a group. Setting up and conducting a group in a professional setting over a period of sessions and evaluating a group in terms of models studied in 412-608.

412-630 FEMINISM, WOMEN AND PSYCHOLOGY. (3) Examination of the complexity of women's lives, through the interaction of feminist and psychological literature about women. Women's diversity and similarities in terms of race, class, sexual orientation and life experiences will be explored.

412-635 COUNSELLING FOR SEXUAL ADJUSTMENT. (3) The counsellor's understanding of his or her own sexuality and an examination of models for counselling others for sexual adjustment. How and when to make appropriate referrals.

412-636 THEORIES OF SEX THERAPY. (3) (Prerequisite: 412-635) An examination of various theoretical approaches to the treatment of sexual dysfunction, with special emphasis on psychodynamic and behavioural models.

412-640 THE FOUNDATIONS OF FAMILY LIFE EDUCATION. (3) An examination of the psychological and sociological foundations of family life education tracing the evolution of theory, research and practice within this domain.

412-660 SELECTED TOPICS IN COUNSELLING. (3) Advanced studies in selected topics in the field of counselling. Areas such as pre-retirement counselling, mid-life transitions, crisis intervention, drug abuse counselling, and the training of paraprofessionals will be explored in depth.

412-662 CAREER PSYCHOLOGY. (3) Contemporary perspectives on career development, career planning and work values are reviewed. Current issues related to career development through the life stages such as personal values and aptitudes, the family and the societal content will be explored within the existing and emerging theories of vocational, developmental, and transitional psychology.

412-665 PRACTICUM IN COUNSELLING. (6) Practice in counselling interactions in preparation for internship. Developing expertise and confidence in a full range of skills to help clients make and implement self-directed choices. Emphasis on the counsellor as an educational and therapeutic agent dealing with vocational, educational, and personal counselling using various intervention modes.

412-670 CURRENT TRENDS IN COUNSELLING. (3) Advanced studies in current trends in the counselling profession. Recent developments in areas such as behavioural counselling, interpersonal process recall, and consultation models will be treated. The content of the course will change periodically to reflect developing trends.

412-679 INTERNSHIP, GENERAL I. (6)

412-680 INTERNSHIP RESEARCH SEMINAR. (6) Students become acquainted with current research designs in both quantitative and qualitative traditions and develop skills in both analyzing research projects and critiquing journal articles. Special emphasis is given to the application of research findings to field settings and clinical process. Lecture, discussion, workshops, and student research presentations are used.

412-681 INTERNSHIP IN GROUP COUNSELLING. (6)

412-682 PRACTICUM IN PSYCHOLOGICAL TESTING. (6) (Prerequisite: 412-609. Open only to students in Counselling Psychology or School/Applied Child Psychology.) Seminar and field practice in the administration and interpretation of educational and psychological tests including personality, within clinical and educational settings. Selection and evaluation of test instruments will be covered. Supervision of report writing and the ethical use of test information.

412-683 INTERNSHIP IN ORGANIZATION AND DEVELOPMENT OF SERVICE PROGRAMS. (6)

412-685 INTERNSHIP IN VOCATIONAL AND REHABILITATION COUNSELLING. (6) Study, observation, and practice of specialized aspects of counselling through Faculty supervision and direction by personnel in the internship setting.

412-697 THESIS PREPARATION I. (6)

412-698 THESIS PREPARATION II. (6)

412-699 THESIS PREPARATION III. (12)

412-701 PH.D. COMPREHENSIVE EXAMINATION.

412-709 ADVANCED THEORIES AND MODELS. (3) (Prerequisite: 412-624) Further study of theories and models in counselling, their history, development, and applications.

412-714 MODELS OF FAMILY THERAPY. (3) For doctoral students in Counselling and School Psychology. Theoretical and therapeutic models in family therapy, core concepts and their relevance for application, intervention strategies, the child in family context, impact on school performance.

412-719 ADVANCED SMALL GROUP COUNSELLING. (3) (Prerequisite: 412-709) Further study of theories and models in counselling, their history, development and applications.

412-720 SEMINAR: VOCATIONAL PSYCHOLOGY AND CAREER DEVELOPMENT THEORY. (6) Review and critique of vocational psychology theories and contributions of contemporary career development theories to the understanding of the processes and the determinants of career choice, life stages, adjustment, and career patterns in personal and vocational development. Study of selected problems, designs and outcomes of research in vocational psychology and career development.

412-770 INDIVIDUAL READING. (6) Candidates may, with the consent of the Program Director, elect this individual reading and conference course.

412-771 INDIVIDUAL READING. (3) (Corequisite: 412-709) Supervised reading on an approved topic leading to completion of a suitable document.

412-780 PROFESSIONAL DEVELOPMENT. (6) (For Ph.D. students in Counselling Psychology and, with permission, in School/Applied Child Psychology.) Individually planned and developed (1) supervision of Master's practicum or internship students, (2) co-teaching with a McGill staff member, and (3) diversified research experiences utilizing different techniques and instrumentation.

412-782 DOCTORAL FIELD EXPERIENCE. (6) (Corequisite: 412-780) A 2-day/week, 2-term (minimum 500 hours) doctoral practicum integrating research, theory, and supervised practica to provide a perspective for clinical work within the field of counselling psychology. Skill development in counselling intervention, assessment, treatment plans, etc. Clientele will be individuals, families, and groups with a variety of concerns.

412-786 SEMINAR: RESEARCH PROBLEMS IN COUNSELLING. (6) Supervised study of selected topics for the particular option selected. These will be reported in the seminar and research and professional problems in counselling common to all levels will be covered with emphasis on recent literature.

412-795 SUPERVISED FIELDWORK IN COUNSELLING. (24) (Prerequisites: 412-679, 680, 682, 685) A 5-day, 10 to 11-month supervised internship (minimum 1200 hours). Study, observation, assessment

and diagnosis, and practice in Counselling Psychology settings. Group seminar and individual conferences. May be accumulated over two years.

414-526 TALENTED AND GIFTED STUDENTS. (3) The psychology and education of exceptionally able children. Definitions, assessment, goals, classroom adaptations, educational programs, and educational issues. The course combines theoretical background and practical concerns. Application component: application of teaching methods with exceptionally able students.

414-527 CREATIVITY AND ITS CULTIVATION. (3) Recent research, theory and educational practice concerning creativity, with special attention to creativity in students and educational settings.

414-536 PRACTICUM IN GIFTED EDUCATION I. (3) (Prerequisite: 414-526) (Permission is required to register; call 398-4252 for an application form.) Supervised practice in demonstration classrooms for gifted and talented children, with supporting seminars. Normally offered in the Summer term concurrently with 414-537.

414-537 PRACTICUM IN GIFTED EDUCATION II. (3) (Prerequisite: 414-526) (Permission is required to register; call 398-4252 for an application form.) Supervised practice in demonstration classrooms for gifted and talented children, with supporting seminars. Normally offered in the Summer term with 414-536.

414-539 FIELD WORK I: EXCEPTIONAL STUDENTS. (3) Supervised experience with exceptional students in an approved educational setting.

414-540 FIELD WORK II: EXCEPTIONAL STUDENTS. (3) (Prerequisite: 414-539) Supervised experience with exceptional students in an approved educational setting.

414-543 FAMILY, SCHOOL AND COMMUNITY. (3) (May be offered through Continuing Education.) Examination of family, school, community, and societal influences on student growth, development and adjustment. Emphasis on family perspectives, school orientation, community services, and community collaboration. Application component: using knowledge and skills in the field.

414-603 READING COURSE. (6)

414-616 READING COURSE. (3)

414-628 GIFTED STUDENTS WITH SPECIAL NEEDS. (3) (Prerequisite: 414-526 or 414-643) Gifted, talented, and creative students with handicaps, disabilities, and other special needs which may or may not compromise their high abilities.

414-636 CURRICULUM IN GIFTED EDUCATION. (3) (Prerequisite: 414-526) Curriculum models for gifted students at the elementary and secondary levels. Primarily intended for students registered in programs in the McGill Summer School for the Gifted.

414-637 ADOLESCENT DEPRESSION. (3) Preparation of teachers and counsellors to deal with depressed adolescents. Theories and models of treatment.

414-642 EDUCATION OF LEARNERS WITH SPECIAL NEEDS I: OVERVIEW. (3) Introduction to learners with different types of special needs. Emphasis on current research and practice of educating students with special needs.

414-643 EDUCATION OF LEARNERS WITH SPECIAL NEEDS II: ISSUES. (3) Contemporary issues in the education of students with special needs: assessment and identification; service delivery models; instructional methods; parent/professional relationships; research priorities; legislative policies; adult education; employment training.

414-645 DIAGNOSIS AND ASSESSMENT IN SPECIAL EDUCATION. (3) Purposes of diagnosis and assessment; formal and informal assessment procedures; issues in traditional testing procedures; emerging trends in assessment.

414-646 BEHAVIOUR MANAGEMENT: THEORY, METHODS AND ETHICS. (3) Theoretical and research bases for behavioural approaches in education of students with special needs; methods of applied behaviour analysis; ethical issues in behaviour management.

414-654 INSTRUCTION/CURRICULUM DESIGN AND ADAPTATION. (3) Adapting instruction and curriculum for students with special needs; developing individualized programs and methods; building curriculum that addresses both academic and social needs of students.

414-656 CLINIC PRACTICUM IN SPECIAL EDUCATION. (6) Participation as a special education professional in a field setting. Opportunity to plan, implement and evaluate curriculum for students with special needs, and participate as a team member.

414-657 PRACTICUM IN LEARNING DISABILITIES. (3) (Prerequisite: a course in learning difficulties or permission of the instructor.) Two-week intensive practicum in learning disabilities in children and adolescents. Theoretical background will be followed by an assessment practicum with students referred from local schools. Offered jointly with the University of New England.

414-658 INTERNSHIP IN LEARNING DISABILITIES. (3) (Prerequisite: 416-657) Supervised internship in evaluation and remedial planning. Under the instructors' supervision, participants will evaluate a student with learning difficulties, and plan and implement a remedial program.

414-661 SEMINAR IN EDUCATIONAL INTEGRATION I. (3) This course provides the rationales for integrated education; research on integration outcomes; historical and legal influences; issues and future trends. Students will be given practical opportunities for developing and/or monitoring integration efforts.

414-662 SEMINAR IN EDUCATIONAL INTEGRATION II. (3) This course presents an overview of models of integration; curricular approaches; changing roles of teachers; transition to community integration. Students will be given practical opportunities for developing and/or monitoring integration efforts.

414-663 INSTRUCTION IN INTEGRATED SETTINGS. (3) A workshop dealing with methods for integration: cooperative learning strategies: curriculum-based assessment and instruction; team planning processes; computer applications for instruction; peer tutoring; specialized resources.

414-664 LEADERSHIP AND CHANGE IN SPECIAL EDUCATION. (3) Systems approaches to educating children with special needs; historical, current, and future models; system change; leadership roles and strategies; program effectiveness.

414-665 RESEARCH & THEORY IN LEARNING DISABILITIES. (3) Review of recent research and literature in the field of learning disabilities; examination of research and theory as it relates to current practices.

414-666 METHODS IN LEARNING DISABILITIES. (3) Specific methods and materials for teaching students with learning disabilities; diagnostic-prescriptive process; methods for varying kinds of specific learning disabilities; needs of students in preschool, elementary, high school and post-secondary levels.

414-667 BEHAVIORAL AND EMOTIONAL PROBLEMS. (3) (Prerequisite: 416-615 or 414-643) Behavioral and emotional problems examined from different psychological perspectives. Theoretical issues and behavior management applications in educational settings.

414-668 PERSONALITY THEORY IN RELATION TO THE SPECIAL CHILD. (3) This course will examine normal personality development from several theoretical viewpoints. Exceptional development will also be examined with emphasis on the learning problems which can arise out of this.

414-669 COGNITIVE DEVELOPMENT IN RELATION TO THE SPECIAL CHILD. (3) This course will deal with the cognitive development of children and adolescents with implications for exceptional children.

414-670 INTEGRATION OF STUDENTS WITH MENTAL HANDICAPS. (3) Societal attitudes toward mental retardation; studies in the development of people with mental handicaps from birth through old age; emphasis on participation in home, school and community.

414-671 CURRICULUM DEVELOPMENT FOR STUDENTS WITH MENTAL HANDICAPS. (3) Issues in the definition and classification of students identified as mentally handicapped; methods for teaching academic, social and vocational skills.

414-680 SELECTED TOPICS IN SPECIAL EDUCATION (I). (3) A detailed examination of recent developments in specific topics of special education. The content of the seminar will vary from year to year and will be announced prior to registration.

414-681 SELECTED TOPICS IN SPECIAL EDUCATION (II). (3) A detailed examination of recent developments in specific topics of special education. The content of the seminar will vary from year to year and will be announced prior to registration.

414-743 SEMINAR ON SPECIAL NEEDS. (3) (Prerequisite: 414-643) Contemporary issues in the education of students with special needs. Professional and research issues.

414-756 INTERNSHIP IN SPECIAL NEEDS EDUCATION. (3) (Prerequisite: 414-656) Supervised internship in special needs education in a field setting tailored to the needs and interests of individual students.

416-099 SUPERVISED TEACHING ASSISTANTSHIP IN EDUCATIONAL PSYCHOLOGY AND COUNSELLING. (0)

416-510 LEARNING AND TECHNOLOGY. (3) Impact of virtual learning communities on learners/teachers in formal schooling and beyond. Information technologies as a resource to enhance learning experiences, creative/critical thinking. Principles of Internet design, authoring, management. Evaluation of computer-based information quality and strategies for efficient and effective use of the technology in education and society.

416-515 GENDER IDENTITY DEVELOPMENT. (3) (Prerequisites: 416-208, 416-300, or a course in developmental psychology.) Theoretical models and empirical findings relevant to the development of gender identity. Special attention is given to the influence of peers in school settings. Psychological, physiological, parental, peer, and cultural influences on gender identity.

416-535 INSTRUCTIONAL DESIGN. (3) The concept of instructional design, specifically its application to planning, enacting, and evaluating a specific course or curriculum unit.

416-545 PRACTICUM IN INSTRUCTIONAL DESIGN. (3) (Prerequisite: 416-535) This course is devoted to extensive work on developing an instructional system. Each student selects a subject area and develops and validates an instructional unit. Students may wish to use this occasion to investigate in depth a particular aspect or feature of instructional design.

416-555 APPLIED COGNITIVE SCIENCE. (3) Examination of foundations of cognitive science including contributions by psychology, linguistics, and computer science. Consideration of theory and methodology of cognitive science in educational and instructional contexts.

Courses 416-560, 416-564 and 416-565 are offered through Continuing Education. Please see the Program Coordinator.

416-560 HUMAN DEVELOPMENT. (3) (Open to Educational and Counselling Psychology students or permission of Associate Program Director required.) A review of current theory and knowledge of human development through the life cycle. Particular attention is given to emotional and social development. All major age-stages are considered. Emphasis is placed on the effects of interaction between individuals of these different age groupings.

416-564 FAMILY COMMUNICATION. (3) (Open to Educational and Counselling Psychology students or permission of Associate Program Director required.) Family communication processes and interpersonal reactions in the context of marriage and the contemporary family will be considered. Attention will be given to role changes and the effect of crises on marital and family relationships.

416-565 PSYCHOSOCIAL ASPECTS OF CANCER. (3) (Open to Educational and Counselling Psychology students or permission of Associate Program Director required.) Psychosocial aspects of the cancer experience; assessment of psychological needs, resources and development of appropriate new coping skills. Crisis intervention, cognitive-behavioral therapy, relaxation, visual imagery, communication, decision making, and pain management, in group and individual modalities, for patients and significant others.

416-575 EDUCATIONAL MEASUREMENT. (3) Statistical measurements in education, graphs, charts, frequency distributions, central tendencies, dispersion, correlation, and sampling errors.

416-595 SEMINAR IN SPECIAL TOPICS. (3) (Permission must be obtained from the Department before registration.) The content of the seminar will vary from year to year and will be announced prior to registration. The seminar may be given by a single instructor or by a group, as the occasion warrants.

416-596 SEMINAR IN SPECIAL TOPICS. (3) Seminar in selected topics in Educational and Counselling Psychology. The topic will vary from year to year and will be announced prior to registration.

416-600 SEMINAR IN EDUCATIONAL PSYCHOLOGY. (3) Current issues and developments and reviews of major areas in educational psychology in the context of research in the Department and the evolution of the discipline at large.

416-602 USES OF RESEARCH FINDINGS IN EDUCATION. (3) (Pre- or co-requisite: 416-575 or equivalent.) Basic concepts of educational research for the student who is likely to be a regular consumer of research but only an occasional generator of research. Mechanics of research: e.g., funding sources, proposal and report preparation, information bases (e.g., the ERIC system), and ethics in research.

416-603 EDUCATIONAL RESEARCH AND DEVELOPMENT FOR PRACTITIONERS. (3) (Prerequisite: 416-602) Development of research projects and proposals, design and methodology. Emphasis on applied research in school settings. Evaluation of research.

416-604 THESIS I. (3) (Corequisite: 416-600) Literature survey and thesis planning.

416-605 RESEARCH METHODS. (3) (Corequisite: 416-676) Research methods and designs, planning and evaluating research, relations between research and statistical designs, interdisciplinary and nonquantitative approaches, meta-analysis, and the use of computers beyond computation. Ethics, scholarly writing.

416-607 THESIS II. (3) (Corequisite: 416-604) Preparation of a thesis proposal.

416-608 SELECTED TOPICS. (3) A detailed examination of recent developments in specific topics in educational psychology. The content will vary from year to year and will be announced prior to registration.

416-609 SELECTED TOPICS IN EDUCATIONAL PSYCHOLOGY. (3) A detailed examination of recent developments in specific topics of educational psychology. The content of the seminar will vary from year to year and will be announced prior to registration.

416-610 HISTORY/DEVELOPMENTAL PSYCHOLOGY. (3) (Corequisite: 416-615) Major figures, theories and schools in the history of developmental psychology, including psychoanalytic, behaviorist, organismic, Piagetian, transactional, and neo-Piagetian.

416-611 SCHOOL PSYCHOLOGY SEMINAR. (3) Open only to School/Applied Child Psychology students. Focus on the profession and practice of school psychology. Four major areas of information within the discipline of school psychology will be addressed: history and organizational systems, psychological service delivery in educational settings, ethical and legal issues, and new trends and future developments in school psychology and training.

416-615 THEORY/ISSUES IN CHILD DEVELOPMENT. (3) Critical examination of the idea of child development. Major questions in the field will be examined, including biology versus the environment, sensitive periods, stage theory, continuity, constructivism, and qualitative change. Assessment of specific models of child development and relevant applications.

416-616 COGNITIVE DEVELOPMENT. (3) Assessment of theories of cognitive development including Piagetian, neo-Piagetian, and information-processing approaches. Theoretical models and empirical findings, and their application to educational and other settings.

416-617 ADOLESCENT DEVELOPMENT. (3) Normal development of adolescents through young adulthood. Problems and concerns of adolescence which occur with physical, social and personal development, in the context of family and school adjustment.

416-619 CHILD AND ADOLESCENT THERAPY. (3) (For School/ Applied Child and Counselling Psychology students only.) Therapeutic models for individual and group interventions for children and adolescents; case histories; gender and cultural minority issues; emphasis on classical and innovative strategies and methods for school and counselling psychologists.

416-620 DEVELOPMENTAL PSYCHOPATHOLOGY. (3) (Prerequisite: 416-615) Theory, research, and practice in developmental processes in the study of psychopathology, including aberrant behavior in childhood, at-risk and resilient children, and mental illness.

416-622 MULTICULTURALISM AND GENDER. (3) Multicultural, multilingual and gender issues as they relate to the practising school and counselling psychologist. Implications and their impact in assessment, research, training, and intervention.

416-623 SOCIAL-EMOTIONAL DEVELOPMENT. (3) (Prerequisites: 416-615, 616 or 620) Social-emotional development including temperament, attachment, gender identity, and peer relations. Biological and environmental influences, continuity and change, and qualitative versus quantitative variables.

416-624 EDUCATIONAL PSYCHOLOGY AND GENDER. (3) Aspects of the social psychology of education relevant to exploring the impact of student and teacher gender on both individuals and educational processes from preschool to postgraduate studies.

416-625 PRACTICUM I IN SCHOOL PSYCHOLOGY. (3) (Prerequisites: 412-609, 412-610, 412-618, 414-654, 416-611, 416-616. Corequisites: 412-682, 416-620.) Clinic experiences (normally 8-10 hours/week) (a) conducting assessment batteries, (b) interpreting assessment findings and developing intervention plans, (c) \ providing remedial services for specific learning domains and practical recommendations, (d) acquiring skills in group intervention techniques. Weekly case review and student progress meetings.

416-626 PRACTICUM II IN SCHOOL PSYCHOLOGY. (3) (Prerequisites: 416-620, 416-625. Corequisite: 412-682) Clinic experiences (normally 8-10 hours/week) building upon 416-625: (a) conducting assessment batteries, (b) interpreting assessment findings and developing intervention plans, (c) providing remedial services for specific learning domains and practical recommendations, (d) acquiring skills in group intervention techniques. Weekly case review and student progress meetings. May continue to the end of the public school year.

416-627 PROFESSIONAL PRACTICE OF PSYCHOLOGY. (3) (Open only to students in Counselling Psychology or School/Applied Child Psychology, or by permission of the instructor and program directors.) Professional and governmental structures regulating the practice of psychology in Quebec, Canada, and North America and their relation to the work of psychologists. Required for licensing in Quebec.

416-628 APPLIED DEVELOPMENTAL PSYCHOLOGY. (3) (Prerequisite: 416-615 or permission of the instructor.) Examination of research, professional and theoretical topics extending beyond the prerequisite course, as applied to education.

416-629 SCHOOL PSYCHOLOGY RESEARCH PROJECT. (6) (Prerequisites: 412-618, 416-605. Corequisite: 416-682) Open to School/Applied Child Psychology students. An individually supervised research project in school/applied child psychology.

416-635 THEORIES OF LEARNING AND INSTRUCTION. (3) An analysis of the relationship between theory and research about learning and teaching from a historical perspective.

416-636 CLASSROOM PROCESSES AND SOCIAL PSYCHOLOGY. (3) Instructional or environmental effects on learning and their implications for educational practice, with particular emphasis on such topics as the social psychology of learning, family background and effects, classroom interaction, teacher impact, and ethnographic and survey approaches to their study.

416-638 THE PSYCHOLOGY OF ART IN EDUCATION. (6) This course explores major theories and content areas within the field of the psychology of art focusing on the following topics: art and cognition from the point of view of the artist and the audience; problems of aesthetic judgment; psychoanalytic theories of art; the development of artistic skills in children; art in cross-cultural contexts; and the relationship between the psychology of art and teaching.

416-640 RESEARCH IN COMPUTER APPLICATIONS. (3) Recent research findings on applications of the computer to educational and psychological issues. Research paradigms. The use of the computer as an object of research as well as a research tool in education. Future directions in research.

416-641 USE OF THE COMPUTER IN EDUCATIONAL INSTRUCTION. (6) Computer-assisted, -aided, and -managed instruction. Direct experience with remote-access terminals and micro-computers, and the writing, preparation and developmental testing of instructional sequences, in computerized form. Parts of this course are presented in computerized mode.

416-643 EVALUATION OF COMPUTER SOFTWARE AND HARDWARE. (3) The importance of evaluation in the selection of software and hardware for education. Establishment of criteria for evaluation. In-depth evaluations and comparisons of a variety of computer software, including word-processing and data-base packages, as well as various types of computer hardware for use within educational settings.

416-645 RESEARCH ON INSTRUCTIONAL PROCESSES. (3) (Corequisite: 635) This course builds critical skills in the analysis of categories of research and methodologies specific to instructional processes.

416-646 SELECTED TOPICS IN THE SOCIAL PSYCHOLOGY OF EDUCATION. (3) Topics vary from year to year but generally deal with the patterns of human interaction in classrooms and schools and their relations to such issues as the social and academic performance of students, reciprocal effects among peer relationships, achievement and motivation, and the stereotyping of behavior and perceptions.

416-648 INSTRUCTIONAL PSYCHOLOGY SEMINAR. (3) (Prerequisites: 416-635) An advanced course intended to provide a framework for the review of theoretical and methodological issues in the field.

416-649 INSTRUCTIONAL PSYCHOLOGY PRACTICUM. (3) (Prerequisites: 416-535, 645, 670) The practical application of the knowledge gained in the Instructional Psychology course sequence in a setting that corresponds to the candidates' professional career goals.

416-650 CONSCIOUSNESS AND VIRTUAL REALITY. (3) An exploration of the nature and role of consciousness from the virtual reality research perspective, and the implications of virtual reality and cyberspace in education.

416-655 COGNITIVE SCIENCE AND EDUCATION. (3) (Prerequisite: 416-555 or permission of instructor.) Seminar treating issues in theory and research on knowledge acquisition and representation, discourse and language processes, problem solving and reasoning, as applied to educational contexts.

416-656 APPLIED COGNITIVE THEORY/METHODS. (3) (Prerequisite: 416-555 or permission of instructor.) Models of knowledge representation, cognitive architectures, and cognitive processes for complex domains of performance and instruction. Methods of data collection that allow testing of models of performance and learning in such domains.

416-660 ARTIFICIAL INTELLIGENCE IN EDUCATION. (3) An exploration of the principles of artificial intelligence as a metaphor for understanding conventional instructional and learning-processes.

Topics include expert systems, intelligent computer-assisted instruction, tutoring systems, fifth-generation languages, and logic programming (e.g. Prolog). Lectures, discussion, demonstrations, and where possible site visits and hands-on experience will be provided.

416-661 DISCOURSE PROCESSES AND EDUCATION. (3) (Prerequisites: 416-655, 656 or permission of the instructor.) Models of discourse representation and processing in realistic settings. Implications of such models for knowledge elaboration, transfer, and acquisition.

416-662 PSYCHOLINGUISTICS AND LEARNING. (3) (Prerequisites: 416-655, 656 or permission of the instructor.) Theory and research on syntactic and semantic processing, and acquisition of language, including second languages. Implications for learning and instruction.

416-663 LEARNING IN COMPLEX SITUATIONS. (3) (Prerequisites: recommended: 416-555, 656 or permission of the instructor.) Theory and research on situated learning, including tutorial interaction and collaborative learning.

416-664 NATURE/DEVELOPMENT OF EXPERTISE. (3) (Prerequisites: 416-655, 656 or permission of the instructor.) Theories of expert performance in complex and realistic situations, including the development of such expertise.

416-665 REASONING AND PROBLEM SOLVING. (3) (Prerequisites: 416-655, 656 or permission of the instructor.) Seminar on theories and methods for research on human problem solving in educational and other complex situations. Includes the development of problem-solving skills.

416-666 COGNITION AND INSTRUCTION. (3) (Corequisite: a graduate course in cognitive or instructional psychology.) Relationships between instructional design and cognitive models. Analysis of instruction and instructional environments from a cognitive perspective.

416-668 SEMINAR IN APPLIED COGNITIVE PSYCHOLOGY. (3) (Prerequisite: 416-655 or permission of the instructor.) Examination of research, professional and theoretical topics extending beyond the prerequisite course, as applied to education.

416-670 EDUCATIONAL EVALUATION. (3) (Prerequisite: 416-635) Theories and models of evaluation as applied to educational programs and instructional systems.

416-671 EDUCATIONAL EVALUATION: THEORY AND PRACTICE. (6) Current models of evaluation of educational programs and products. These include objectives-based, discrepancy, decision-making and responsive models. Methods of evaluation both experimental and ethnographic. Emphasis is on the application of the models and methods to an evaluation project.

416-675 INTERMEDIATE STATISTICS I. (3) (Prerequisite: 416-575 or equivalent.) Central tendency, variation, coorelation, simple regression, chi-square, estimation, hypothesis testing, selected inferential techniques (parametric and non-parametric). Computer data processing using existing packages.

416-676 INTERMEDIATE STATISTICS II. (3) (Prerequisite: 416-675 or equivalent.) Analysis of variance and covariance, fixed, random and mixed effects, crossed and nested designs; regression models. Computer data processing using existing packages.

416-682 UNIVARIATE/MULTIVARIATE ANALYSIS. (3) (Prerequisite: 416-676) General linear model as a unified data analytic system for estimation and hypothesis testing that subsumes regression, analysis of variance, and analysis of covariance for single dependent variables. Introduction to generalizations involving multiple dependent (criterion) variables. Applications oriented toward education, educational psychology and counselling psychology. Experience with data-analysis tools.

416-684 APPLIED MULTIVARIATE STATISTICS. (3) (Prerequisite: 416-682 or equivalent.) Principal methods, models, and hypothesis-testing procedures for the prediction and analysis of patterns, structure, and relationships in multivariate date, e.g., discriminant, principal components, canonical correlation, profile analyses, measurement models, factor and path analysis, repeated measures. Applications oriented toward education and educational and counselling psychology. Experience with data-analysis tools.

416-685 STUDIES IN EDUCATIONAL PSYCHOLOGY: MEASUREMENT OF INDIVIDUAL DIFFERENCES IN LEARNING AND ABILITY. (3) (Corequisite: 416-676 or equivalent.) Theoretical and methodological approaches to the measurement and description of individual and group differences in cognitive abilities, learning, and other intellectual traits or processes. Measurement of abilities and learning, assessment of growth and development, group differences in intellectual processes, statistical theories of mental tests, and factor analysis.

416-687 ADVANCED QUALITATIVE METHODS. (3) (Prerequisite: 411-692 or the equivalent.) Origins of qualitative methodologies in sociology, psychology, and education in relation to ideology, epistemology, and methodology. Focus on data reduction and field methods.

416-688 SEMINAR IN MEASUREMENT, EVALUATION AND RESEARCH DESIGN. (3) (Prerequisite: Any of 416-671, 416-676, 416-682, 416-684, according to the topic in a particular semester; permission of the instructor.) Examination of research, professional, and theoretical topics extending beyond the prerequisite course.

416-691 READING COURSE. (3)

416-692 READING COURSE. (6)

416-693 THESIS III. (3) Thesis research under supervision of a research director.

416-694 THESIS IV. (3) Thesis research under supervision of a research director.

416-695 THESIS V. (6) Thesis research under supervision of a research director.

416-696 THESIS VI. (6) Thesis research under supervision of a research director.

416-697 SPECIAL ACTIVITY I. (6)

416-698 SPECIAL ACTIVITY II. (6) A project relevant to improving educational practice. It may be an internship, a research project, or an innovation in teaching, supervised by the student's advisor and with the approval of the department. It is completed by the submission of a project report, monograph, or production. For M.Ed. students only.

416-705 ADVANCED SEMINAR ON CURRENT PROBLEMS IN EDUCATIONAL PSYCHOLOGY. (6) Research and theory in the study of human learning and teaching and related psychological considerations. An exploration of present frontiers of knowledge in these areas and of research and analytical methods appropriate for their study, in the laboratory and in field settings. Full course, to be taken during the first year of Ph.D. study. (Taught by the Program Committee.)

416-708 PH.D. COMPREHENSIVE EXAMINATION. A four-part evaluation which is normally taken at the end of the Ph.D. 2 year. A detailed description of the examination is provided to all students.

416-710 CONSULTATION IN SCHOOL PSYCHOLOGY. (3) (Corequisites: 416-625, 416-626 or equivalent.) Open only to students in School/Applied Child Psychology and with permission, Counselling Psychology and Special Populations Major. A clinical course on the use of consultation in educational and school-related settings. Topics include: consultation theory, the process of evaluations of the consultation process and outcomes, critical study of relevant research and practice. Includes problem identification, problem analysis, treatment implementation, and treatment evaluation of one case.

416-712 NEUROLOGICAL BASES OF BEHAVIOR. (3) Development of human brain structure and function related to sensory, motor, emotional, perceptual, cognitive, and linguistics skills. Neuroanatomy and neurophysiology relevant to neuropsychological function, dysfunction, rehabilitation. Psychopharmacological influences.

416-721 SCHOOL PSYCHOLOGY: ELEMENTARY. (6) (Prerequisites: 416-626) Open only to Ph.D. students in School/Applied Child Psychology. Field experience. Two days or 16 hours per week supervised by faculty members and a field supervisor in a school

providing elementary education. Weekly class meetings. Students must also register for either 416-722 or 416-723 in the same academic year.

416-722 SCHOOL PSYCHOLOGY: SECONDARY. (6) (Prerequisite: 416-626) Open only to Ph.D. students in School/Applied Child Psychology. Field experience. Two days or 16 hours per week supervised by faculty members and a field supervisor in a school providing secondary education. Weekly class meetings. Students must also register for either 416-721 or 416-723 in the same academic year.

416-723 SCHOOL PSYCHOLOGY: COMMUNITY. (6) (Prerequisite: 416-626) Open only to Ph.D. students in School/Applied Child Psychology. Field experience. Two days or 16 hours per week supervised by faculty members and a field supervisor in an educationally relevant community or institutional setting. Weekly class meetings. Students must also register for either 416-721 or 416-722 in the same academic year.

416-725 INTERNSHIP I IN SCHOOL PSYCHOLOGY. (12) (Prerequisites: 416-708 and two of 416-721, 416-722 or 416-723) Open only to Ph.D. students in School/Applied Child Psychology. A 2½ day, 10 to 12-month supervised internship (minimum 600 hours) including assessment and diagnosis normally in a school-based setting. This also includes group supervision to discuss cases that arise in internship settings. May be combined with 416-726 in a single full-time year long internship; this full-time pattern is typical in accredited sites.

416-726 INTERNSHIP II IN SCHOOL PSYCHOLOGY. (12) (Prerequisites: 416-708 and two of 416-721, 416-722 or 416-723) Open only to Ph.D. students in School/Applied Child Psychology. A 2½ day, 10 to 12-month supervised internship (minimum 600 hours) including assessment and diagnosis normally in an educationally relevant community-based center (e.g., hospital, clinic), group supervision, case discussions. May be combined with 416-725 in a single full-time year long internship; this full-time pattern is typical in accredited sites.

449-582 HIGHER EDUCATION THEORY AND POLICY. (3) Major issues facing universities and colleges in Canada and internationally. Review of systems of higher education in Canada. Analysis of the most important issues across higher education institutions, for example, quality of programs, instruction.

449-588 THE HIGHER EDUCATION ENVIRONMENT. (3) Investigation of the postsecondary environment, its constraints and potential for facilitating intellectual development and higher order learning. The student in the learning environment. In-depth analysis of the learning environment provided by universities and colleges, with an emphasis on the steps that can be taken to ensure effective teaching and learning.

449-681 HIGHER EDUCATION DEVELOPMENT. (3) (Corequisite: 449-582 or permission of instructor.) Analysis of program and curriculum development across disciplines and multidisciplinary areas of study at the postsecondary level. Program organization and planning in particular disciplinary areas and in relation to that of other disciplines.

449-689 TEACHING AND LEARNING IN HIGHER EDUCATION. (3) Students will develop an understanding of teaching and learning as a process in which instruction is based on the learning to be accomplished. Students will design, develop, and evaluate a university course of their choice, and will develop facility and confidence in using teaching methods appropriate to their domains.

449-692 PRACTICUM IN UNIVERSITY TEACHING I. (3) Supervised by a professor in their Department, students will experience all aspects of planning and conducting a university course. This includes directed observation of course sessions, and the planning and implementation of teaching episodes. In order to enrol, the student must obtain agreement from the supervising professor in advance.

450-610 FOUNDATIONS OF ADULT EDUCATION. (3) Adult education in the North American context, with emphasis on Canada; historical development; conceptual bases; contemporary trends; major literature in the field.

450-612 THE ADULT LEARNER. (3) Patterns of adult development; application of theories of learning to the adult learner; influence of such factors as work history, family role, learner needs and motivation on the role of the adult as learner.

450-614 TEACHING THE ADULT. (3) Teacher roles in adult education; instructional strategies and systems such as self-directed learning and learning contracts; comparisons and contrasts with the teaching of the young.

450-615 ADMINISTERING ADULT EDUCATION PROGRAMS. (3) Human resource management in relation to unique employment conditions in the field; the procurement, disbursement and control of funds.

450-618 ISSUES IN ADULT EDUCATION. (3) Selected issues related to policy, curriculum, and alternative models in adult education, with particular emphasis given to Quebec and Canadian settings.

450-620 SELECTED TOPICS IN ADULT EDUCATION. (3) Seminar on special topics such as adult literacy education, the education of handicapped adults, educational services to an aging population. Content of the seminar will vary from year to year.

450-628 PRACTICUM IN ADULT EDUCATION. (6) Observation of a skilled practitioner and supervised experience in an adult education setting.

450-638 MONOGRAPH. (6) An independent investigation of a topic in adult education leading to the submission of a substantial written report.

Courses in Other Departments

Students interested in statistical models and techniques in test theory are welcome to enrol in 204-510 (Dept. of Psychology):

204-510 STATISTICAL ANALYSIS OF TESTS. (3) (2 lectures; Prerequisites: 204-305 or 435B, 204-406 or permission of instructor.) This course aims to introduce students interested in developing or appraising tests to the important statistical problems and modern techniques associated with testing data. Testing situations discussed will range from one-shot classroom tests through special purpose scales to the highly refined large scale tests such as the SAT.

Qualitative research methods are offered primarily through 411-692, 431-617 or 431-630 (Department of Integrated Studies in Education) and 416-687 (Department of Educational and Counselling Psychology).

411-692 QUALITATIVE RESEARCH METHODS. (3) Theoretical and practical exploration of the foundations of qualitative methods, with emphasis on underlying principles.

431-617 SPECIAL TOPIC. (3) Qualitative and ethnographic research methods. (May be offered in conjunction with 431-630.)

431-630 QUALITATIVE AND ETHNOGRAPHIC STUDIES IN SECOND LANGUAGE EDUCATION. (3) An examination of theoretical and applied issues in qualitative and ethnographic studies in second language education.

455-635 ADVANCED WRITTEN COMMUNICATION. (3) Rhetorical practices and principles that remain constant across disciplines: generating and organizing ideas; setting goals; planning; considering readers; editing and revising. Students will analyze and produce texts that use the formats, rhetorical strategies, styles, genres, and other conventions of their disciplines.

Students are encouraged to broaden their perspectives with elective courses from elsewhere in the Faculty of Education and the University as a whole. Eligibility to enrol in a specific course should always be ascertained in advance.

27 Electrical and Computer Engineering

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Chair — D.A. Lowther

Associate Chair (Director, Graduate Program) — J.P. Webb

27.1 Staff

Emeritus Professors
E.L. Adler; B.Sc.(Lond.), M.A.Sc.(Tor.), Ph.D.(McG.), Eng.
G.W. Farnell; B.A.Sc.(Tor.), S.M.(M.I.T.), Ph.D.(McG.), F.I.E.E.E., Eng.
T.J.F. Pavlasek; B.Eng., M.Eng., Ph.D.(McG.), Eng.

Professors
P.R. Bélanger; B.Eng.(McG.), S.M., Ph.D.(M.I.T.), F.I.E.E.E., Eng.
P.E. Caines; B.A.(Oxon.), D.I.C., Ph.D.(Lond.), F.I.E.E.E.E., F.C.I.A.R.
C.H. Champness; M.Sc.(Lond.), Ph.D.(McG.) (part-time)
F.D. Galiana; B.Eng.(McG.), S.M., Ph.D.(M.I.T.), Eng.
P. Kabal; B.A.Sc., M.A.Sc., Ph.D.(Toronto)
T. Le-Ngoc; M.Eng.(McG.), Ph.D.(Ott.), F.I.E.E.E.
M.D. Levine; B.Eng.(McG.), Ph.D.(Lond.), F.C.I.A.R., Eng.
D.A. Lowther, B.Sc.(Lond.), Ph.D.(C.N.A.A.), F.C.A.E., Eng.
B.T. Ooi; B.E.(Adel.), S.M.(M.I.T.), Ph.D.(McG.), Eng.
N.C. Rumin; B.Eng., M.Sc., Ph.D.(McG.), Eng.
J.P. Webb; B.A., Ph.D.(Cantab.)

Associate Professors
B. Champagne; B.Eng., M.Eng.(Montr.), Ph.D.(Tor.)
J. Clark; B.Sc., Ph.D.(Br.Col.)
F. Ferrie; B.Eng., M.Eng., Ph.D.(McG.)
V. Hayward; Dip.d'Ing.(ENSM, Nantes), Doc.Ing.(Orsay), Eng.
H. Leib; B.Sc., M.Sc.(Technion-Israel), Ph.D.(Tor.)
S. McFee; B.Eng., Ph.D.(McG.)
H. Michalska; B.Sc., M.Sc.(Warsaw), Ph.D.(Lond.)
D. Plant; M.S., Ph.D.(Brown) *(James McGill Professor)*
G. Roberts; B.A.Sc.(Wat.), M.A.Sc., Ph.D.(Tor.), Eng. *(James McGill Professor)*
I. Shih; M.Eng., Ph.D.(McG.)

Assistant Professors
T. Arbel; M.Eng., Ph.D.(McG.)
J. Bajcsy; B.Sc.(Harv.), M.Eng., Ph.D.(Prin.)
B. Boulet; B.Sc.(Laval), M.Eng.(McG.), Ph.D.(Tor.)
L. Chen; B.Eng.(McG.), M.A.Sc., Ph.D.(Tor.)
J. Cooperstock; B.Sc.(Br.Col.), M.Sc., Ph.D.(Tor.)
M.El-Gamal; B. Sc.(Cairo),M.Sc.(Nashville), Ph.D.(McG.)
D. Giannacopoulos; M.Eng., Ph.D. (McG.)
A. Kirk; B.Sc.(Brist.), Ph.D.(Lond.) *(William Dawson Scholar)*
F. Labeau; M.S., Ph.D., (Louvain)
R. Negulescu; M..Sc.(Romania),M.Sc.(France), Ph.D.(Waterloo)
Z. Zelic; B. Eng.(Zagreb), M.Sc., Ph.D.(Toronto)

Lecturer
K.L. Fraser; B.Eng., M.Eng.(McG.), Eng.

Adjunct Professors
R. Bartnikas, M.L. Blostein, J.L. Bouchard, E. Cerny, S. Chamlian, C. Charalambous, D. Grant, M. Huneault, C.K. Jen, G. Joos, M. Kaplan, K. Khordoc, I.Leszkowicz, L. Lin, M. Marin, D. McGillis, D. O'Shaughnessy, N. Puetz, J. Regnier, F. Rizk, M.R. Soleymani.

Associate Members
M. Buehler *(Mechanical Engineering);* B. Segal; G. Dudek *(Computer Science);* A.C. Evans, W.R. Funnell, H.L. Galiana, J. Gotman, R.E. Kearney, B. Pike *(Biomedical Engineering*)

Visiting Professor
B. Prasada; M.Sc.(Ban), Ph.D.(Lond.)

27.2 Programs Offered

The Department offers programs of graduate studies leading to a degree of Master of Engineering or Doctor of Philosophy.

An equivalent of one (1) calendar year of full time study is required to obtain a Master's in Engineering.

The Ph.D. program maintains a requirement of the equivalent of two (2) calendar years of full time study besides the requirements for the Master's degree.

The research interests and facilities of the Department are very extensive, involving more than 30 faculty members and 200 post-graduate students. The major activities are divided into the following groups: Biomedical Engineering, Communications Systems, Computer Vision and Robotics, Computational Analysis for Engineering Design, Software Systems for Intelligent Design, Electronic Devices and Materials, High Frequency Electromagnetics and Optics, Power Engineering, Systems and Control, Microelectronics and Computer Systems, and Photonics.

Research Facilities

The Department has extensive laboratory facilities for all its main research areas. In addition, McGill University often collaborates with other Institutions for teaching and research.

- The laboratories for research in Robotics, Control and Vision are in the Centre for Intelligent Machines (CIM).
- Telecommunications laboratories focus their work on signal compression and wireless communications. These laboratories form part of the Canadian Institute for Telecommunications Research (CITR). This is a federally funded network of Centers of Excellence.
- The Microelectronics and Computer System (MACS) Laboratory supports research in VLSI, mixed signal circuits, design for testability, formal methods telecommunications, computing and optical systems.
- Antenna and microwave research, and optical fiber and integrated optics research are carried out in a fully equipped facility.
- The Photonics Systems laboratory includes continuous wave and femtosecond Ti:Sapphire lasers, diode lasers, extensive optics and optomechanics, and sophisticated electronic and imaging equipment.
- Solid state facilities include measurement equipment for magnetic and electric properties of materials, vacuum deposition and RF sputtering systems.
- The Computational Analysis and Design Laboratory provides tools for numerical analysis, visualization, interface design and knowledge-based system development.
- There is also a well-equipped laboratory for power electronics and power systems research.

The Department has extensive computer facilities. Most research machines are networked providing access to a vast array of hardware. In addition, McGill University is linked to the Centre de Recherche Informatique de Montréal (CRIM) and the University Computing Centre.

There are three other universities in Montreal: Concordia University is the other English language university; L'Université de Montréal, and its affiliated school of engineering, L'Ecole Polytechnique, is the largest Francophone university; L'Université du Québec has a campus in Montreal and in major towns throughout the province.

The proximity of these schools to McGill University, ensures a rich array of courses is available to suit individual needs. McGill also collaborates on research projects with many organizations such as l'Institut Nationale de la Recherche de L'Hydro-Québec

(IREQ) and L'Institut Nationale de la Recherche Scientifique (INRS).

Financial Support

Graduate Assistantships: The Department awards a number of graduate assistantships that carry an annual stipend of approximately Can$15,000 per year to qualified full-time graduate students. These are normally funded from research grants or contracts awarded to individual faculty members. In return, the graduate assistant is expected to perform research-related tasks assigned by the professor from whose grant the assistantship is paid. A good part, but not necessarily all, of this work can be used for preparing a thesis. There is no special application form for graduate assistantships; all applicants who indicate a need for support on their application forms will be considered. A large fraction of research funding comes from Canadian Government agencies, with the stipulation that only graduate students who are either Canadian citizens or Permanent Residents may be supported. Consequently, graduate assistantships can be offered to a very small number of international students. They should also note that Canadian authorities will not grant an Immigrant Visa to a foreign national who wishes to enter Canada to study.

Teaching Assistantships: Graduate students, with the approval of their supervisors, may also undertake teaching assistantship for an additional remuneration of between Can$400 to Can$3,000 per year. These are awarded at the beginning of the semester. The Department can make no prior commitments.

Differential Fee Waivers: All eligible visa students accepted or registered in a full-time term of residency will be considered for a limited number of waivers that reduce international tuition fees to the equivalent of Canadian tuition fees. McGill bases awards entirely on academic merit.

Graduate students can also receive financial aid through either fellowships, loans or bursaries. For more information, please refer to the Fellowships and Awards website (http://www.mcgill.ca/fgsr/fellowl.htm), or contact the Faculty of Graduate Studies and Research Office, McGill University, James Administration Building, Room 400, 845 Sherbrooke Street West, Montreal, QC H3A 2T5.

27.3 Admission Requirements

TOEFL Requirement: Non-Canadian applicants whose mother tongue is not English and who have not completed an undergraduate degree using the English language, must submit documented proof of competency in English by a Test of English as a Foreign Language (TOEFL) with a score not below 600 on the paper-based test (250 on the computer-based test) or IELTS with a minimum overall band of 7.0. Permanent Residents may also be required to submit TOEFL results. Official results must be received before February 1st.

GRE Requirement: A GRE (Graduate Record Examination) score on the General Aptitude Test is required by all students who have completed their undergraduate degrees outside Canada. A minimum total score of 1800 is required. Official results must be received before Februar y1st.

M.Eng. Degree (Admission Requirements)

The applicant must be the graduate of a recognized university and hold a Bachelor's degree equivalent to a McGill degree in Electrical or Computer Engineering or a closely allied field. An applicant holding a degree in another field of engineering or science will be considered but a qualifying year may be given to make up any deficiencies. The applicant must have a high academic achievement: a standing equivalent to a Cumulative Grade Point Average **(CGPA) of 3.0 out of 4 (75%) or a GPA of 3.2 out of 4.0 for the last two full-time academic years.** Satisfaction of these general requirements does not guarantee admission. Admission to graduate studies is limited and acceptance is on a very competitive basis.

Ph.D. Degree (Admission Requirements)

Candidates who fulfill the general requirements of the Faculty of Graduate Studies and Research and who possess a Master's degree may be accepted for a course of study leading to the Ph.D. degree in Electrical Engineering.

27.4 Application Procedures

Applications will be considered upon receipt of:

1. completed application form;
2. application fee (Can$60);
3. two official copies of all previous transcripts;
4. two reference letters (sent directly by the referees);
5. TOEFL and GRE scores (if applicable).

Applications are processed in March for the following September session. This takes place once every year. **There is no January admission.** All documents must be directly sent to to Graduate Program Admissions, Department of Electrical and Computer Engineering.

The deadline to receive the complete application in the Department is **February 1.**

27.5 Program Requirements

A student may satisfy the M.Eng. degree requirements by completing one of the following options:

M.Eng. Thesis Option (46 credits)
The Thesis option requires satisfactory completion of six graduate level courses (with a grade of B or better) of which four courses must be chosen from the Department (304-5xx or 304-6xx), plus research leading to a Master's thesis (28 credits), the total amounting to at least 46 credits. Students who are required to take more than two non-departmental courses must bring a letter of recommendation from their supervisors outlining the reason for such an action. There are no circumstances under which the maximum number of non-departmental courses will be raised above three. The following are the thesis component courses:

304-691 Thesis Research I	4 credits
304-692 Thesis Research II	4 credits
304-693 Thesis Research III	4 credits
304-694 Thesis Research IV	4 credits
304-695 Thesis Research V	4 credits
304-696 Thesis Research VI	4 credits
304-697 Thesis Research VII	4 credits
Total credit weight of thesis:	28 credits

Students who choose the thesis option must register for all 28 credits during the course of study. Students in the thesis option must carry a full load (minimum of 12 credits) during the three terms of the residency requirement.

M.Eng. Non-Thesis (Project) Option (47 credits)
The Project option requires satisfactory completion of at least nine graduate level courses (with a grade of B or better) of which six courses must be chosen from the Department (304-5xx or 304-6xx), plus a project (up to 20 credits), the total amounting to 47 credits. Students who are required to take more than three non-departmental courses must bring a letter of recommendation from their supervisors outlining the reason for such and action. There are no circumstances under which the maximum number of non-departmental courses will be raised above four. The following are the project component courses:

304-651 Research Project I	1 credit
304-652 Research Project II	2 credits
304-653 Research Project III	3 credits
304-654 Research Project IV	4 credits
304-655 Research Project V	5 credits
304-656 Research Project VI	5 credits
Total number of project credits: 20 credits	

The credits assigned to the project can vary between 11 and 20 depending on the number of course credits taken. A part-time program is possible.

Non-thesis option students have an oral presentation and two examiners grade their project.

Ph.D. Program Requirements

To complete the doctoral program, the following requirements must be met.

a) Successful completion of the courses prescribed by the student's Supervisory Committee.

b) Completion of a minimum of two units (100 hours) of teaching work (tutoring or lab demonstration). A written confirmation of the type of teaching work done either inside or outside the Department must be submitted to the Department.

c) Passing the Qualifying Examination (course 304-701). Students must register for this course upon admission to the doctoral program. It is recommended that the exam take place within one year of admission to the doctoral program. The contents of the Qualifying Examination are set at the Preliminary Meeting. The examiners at the Qualifying Examination include the student's Supervisory Committee together with any other examiners chosen by the committee. Successful completion of this course will award the student a PASS grade in the course 304-701.

d) Approval of the thesis proposal submitted by the student (course 304-702). Students must register for this course upon successful completion of the course 304-701. It should be completed within one year of the Qualifying Examination. The student must present a brief written thesis proposal to the Supervisory Committee. The proposal should contain a statement of the proposed research, results already obtained, if any, and expected results. The proposal is to be received by members of the Committee in advance of its presentation. The format of the thesis proposal submission is an oral presentation of the written statement by the student and then a period in which he/she will be questioned on the proposal by the Supervisory Committee. When the proposal is accepted by the Supervisory committee, the student receives a PASS grade in the course 304-702.

e) Passing the final thesis defense conducted by the Faculty of Graduate Studies and Research.

27.6 Courses

The names of course instructors are listed on the Course Timetable available on ***info*McGill** via the Web http://www.mcgill.ca/students/courses/.

The course credit weight is given after the title, along with the number of weekly contact hours (lectures, lab/tutorials) and expected hours of study, e.g. 3(3-0-6) indicates 3 credits (3 lecture hours - no other contact hours - 6hours of personal study).

● Denotes courses not offered in 2001-02.

▭ Denotes limited enrolment.

304-501A LINEAR SYSTEMS. 3(3-0-6) (Prerequisite: 304-304) State equations and input-output descriptions of linear systems: basic properties and solution. Observability and controllability. Matrix Fraction Descriptions. Canonical forms. Feedback synthesis: linear quadratic control problems, pole placement, observers and compensators. (Awaiting University approval)

304-502B CONTROL ENGINEERING. 3(3-0-6) (Prerequisites: 304-303, 304-305) Modelling of engineering systems, simulation. Linear systems theory. Performance limitations. Stability of single-input-single-output closed-loop systems. Classical design in the frequency domain. Sampled-data implementation of coutinuous-time design.

● **304-503B LINEAR STOCHASTIC SYSTEMS I.** 3(3-0-6) (Prerequisites: 189-587 or 304-510)

● **304-504B COMPUTER CONTROL.** 3(3-0-6) (Prerequisites: 304-404 or 304-502 and 304-305)

● **304-505B NONLINEAR CONTROL SYSTEMS.** 3(3-0-6) (Prerequisite: 304-501)

304-507A OPTIMIZATION AND OPTIMAL CONTROL. 3(3-0-6) (Prerequisites: 189-265 or 189-248 and 189-270 or 189-247) General Introduction to optimization methods including steepest descent, conjugate gradient, Newton algorithms. Generalized matri inverses and the least squared error problem. Introduction to constrained optimality; convexity and duality; interior point methods. Introduction to dynamic optimization; existence theory, relaxed controls, the Pontryagin Maximum Principle. Sufficiency of the Maximum Principle.

304-509A PROBABILITY AND RANDOM SIG. II. 3(3-0-6) (Prerequisites: 304-304 and 304-305) Multivariate Gaussian distributions; finite-dimensional mean-square estimation (multivariate case); principal components; introduction to random processes; weak stationarity: correlation functions, spectra, linear processing and estimation; Poisson processes and Markov chains: state processes, invariant distributions; stochastic simulation.

304-510B RANDOM PROCESSES. 3(3-0-6) (Prerequisite: 304-509) Finite-dimensional distribution functions. Estimation, Orthogonal Projection Theorem. Linear stochastic systems; Kalman filtering. Stationary stochastic processes: spectral Representation Theorem, Wiener filtering, Wold decomposition; ARMA processes. Brownian Motion; Ito integral and stochastic differential equations; forward and backward equations for diffusions. Ergodic theorems. Stochastic dynamic programming. Applications to communication and control systems

304-511A INTRO. TO DIGITAL COMM. 3(3-0-6) (Prerequisite: 304-304. Corequisite: 304-509) An advanced version of 304-411. Amplitude and angle modulation including AM, FM, FDM and television systems; introduction to random processes; sampling and quantization, PCM systems, TDM; digital modulation techniques, Maximum-Likelihood receivers, synchronization issues; elements of information theory including information sources, source coding and channel capacity.

304-512A DIGITAL SIGNAL PROCESSING I. 3(3-0-6) (Prerequisite: 304-304 and 304-305) Review of discrete-time transforms, sampling and quantization, frequency analysis. Structures for IIR and FIR filters, coefficient quantization, roundoff noise. The DFT, its properties, frequency analysis and filtering using DFT methods, the FFT and its implementation. Multirate processing, subsampling and interpolation, oversampling techniques.

304-521A DIGITAL COMMUNICATIONS I. 3(3-0-6) (Prerequisite: 304-411 or 304-511. Corequisite: 304-509.) Modulation: orthogonal and biorthogonal signalling, MPSK, QAM, modulation with memory. Detection: coherent, noncoherent and differentially coherent detection, performance issues and channel capacity, synchronization. Coding: block and convolutional codes, fast Hadamard Transform decoding, Viterbi algorithm, turbo-codes. Band-limited channels: intersymbol interference , spectral shaping, correlative coding, data estimation and channel equalization.

● **304-522A ASYNCHRONOUS CIRCUITS & SYSTEMS.** 3(3-3-3) (Prerequisite: 304-323)

304-523B SPEECH COMMUNICATIONS. 3(3-0-6) (Prerequisite: 304-412 or 304-512) Articulatory and acoustic descriptions of speech production, speech production models, speech perception, digital processing of speech signals, vocodors using formant, linear predictive and cepstral techniques, overview of automatic speech recognition systems, speech synthesis systems and speaker verification systems.

● **304-525B COMPUTER ARCHITECTURE.** 3(3-0-6) (Prerequisites: 304-222 and 304-323)

304-526B ARTIFICIAL INTELLIGENCE. 3(3-0-6) (Prerequisite: 304-222) Design principles of autonomous agents, agent architectures, machine learning, neural networks, genetic algorithms, and multi-agent collaboration. The course incudes a term project that consists of designing and implementing software agents that collaborate and compete in a simulated environment. (Change in course description Awaiting University approval.)

304-527B OPTICAL ENGINEERING. 3(3-0-6) (Prerequisites: 304-304 and 304-352) A structured introduction to modern optical engineering. Topics covered include the propagation of light

through space, refraction, diffraction, polarization, lens systems, ray-tracing, aberrations, computer-aided design and optimization techniques, Gaussian beam analysis, micro-optics and computer generated diffractive optical elements. Systems and applications will be stressed throughout.

● **304-528A TELECOMM. NETWORK ARCHITECTURE.** 3(3-0-6) (Prerequisite: 304-411 or 304-511. Corequisite: 304-509)

304-529A IMAGE PROCESSING AND COMMUNICATION. 3(3-0-6) (Prerequisite: 304-304) Introduction to vision in man and machine; computer vision systems; biological vision systems; biological signal processing; edge detection; spatial- and frequency-domain processing; color. Low-level visual processing in computer vision, psychophysics, and neurobiology, and their similarities and differences.

● **304-530B LOGIC SYNTHESIS.** 3(3-2-4) (Prerequisite: 304-323)

304-531B REAL TIME SYSTEMS. 3(3-3-3) (Prerequisites: 304-323 and 304-222) Real-time engineering applications of computers to online control communication systems and data acquisition. Aspects of hardware, software, interfacing, operating systems, and their integration into a complete system are addressed.

304-532A COMPUTER GRAPHICS. 3(3-3-3) (Prerequisite: 304-222) Introduction to computer graphics systems and display devices: raster scan, scan conversion, graphical input and interactive techniques – window environments; display files: graphics languages and data structures: 2D transformations; 3D computer graphics, hidden line removal and shading; graphics system design; applications. Laboratory project involving the preparation and running of graphics programs.

304-533B PHYSICAL BASIS OF SEMICONDUCTOR DEVICES. 3(3-0-6) (Prerequisites: 304-330, 304-351 and 198-271) Quantitative analysis of diodes and transistors. Semiconductor fundamentals, equilibrium and non-equilibrium carrier transport, and Fermi levels. PN junction diodes, the ideal diode, and diode switching. Bipolar Junction Transistors (BJT), physics of the ideal BJT, the Ebers-Moll model. Field effect transistors, metal-oxide semiconductor structures, static and dynamic behaviour, small-signal models.

304-534A ANALOG MICROELECTRONICS. 3(3-0-6) (Prerequisite: 304-334) Design of analog ICs using specialized analog CAD tools such as SPICE. Voltage and current amplifier design which encompasses the study of biasing circuits, current sources and mirrors, input and output stages, and frequency compensation; precision reference sources; analog multipliers; oscillators; waveform generators and shaping circuits, and analog switches.

304-536A RF MICROELECTRONICS. 3(3-3-3) (Prerequisite: 304-334. Corequisite 304-352.) Introduction to Radio Frequency Integrated Circuits and wireless transceiver architectures. Modeling of passive/active integrated devices. Design of monolithic bipolar and CMOS LNA's, mixers, filters, broadband amplifiers, RF power amplifiers, VCO's, and frequency synthesizers. Analysis of noise and non-linearity in RFIC's. Project using modern RFIC simulation/layout CAD tools. (Awaiting University approval)

304-543B NUMERICAL METHODS IN ELECTRICAL ENGINEERING. 3(3-0-6) (Prerequisites: 304-222, 304-334 and 304-352) DC resistor networks and sparse matrix methods. Nonlinear electric and magnetic circuits: curve-fitting; the Newton-Raphson method. Finite elements for electrostatics. Transient analysis of circuits: systems of Ordinary Differential Equations; stiff equations. Transient analysis of induced currents. Solution of algebraic eigenvalue problems. Scattering of electromagnetic waves: the boundary element method; numerical integration.

● **304-545A MICROELECTRONICS TECHNOLOGY.** 3(3-0-6) (Prerequisite: 304-432 or 304-533)

304-547B FINITE ELEMENTS IN ELECTRICAL ENGINEERING. 3(3-0-6) (Prerequisites: 304-222 and 304-352) Finite elements for electrostatics. Energy minimization. Semi-conductors. Nonlinear magnetics and Newton-Raphson. Axisymmetric problems. Capacitance, inductance, and resistance through finite elements. Resonance: cavities, waveguides. High order and curvilinear elements.

▭ **304-548A INTRODUCTION TO VLSI SYSTEMS.** 3(2-2-5) (Prerequisites: 304-334 and 304-323) (Limited enrollment - 20. Password card required.) An interdisciplinary course for electrical engineering and computer science students. A structured design methodology for managing the complexity of VLSI system design. Sufficient information on integrated devices, circuits, digital subsystems and system architecture is presented to enable students to span the range of abstractions from device physics to VLSI digital systems.

304-549A EXPERT SYSTEMS IN ELECTRICAL DESIGN. 3(3-0-6) (Prerequisites: 304-361 and 304-323) Design processes in electrical engineering. Hierarchical design. Computer aided design. Expert system technology. Device representations, heuristics and structures, algebraic models. Design versus diagnosis, "Shallow" and "Deep" systems, second generation (multi-paradigm) systems. Shells and their uses in design systems. Knowledge acquisition systems. (Awaiting University approval)

304-559B FLEXIBLE AC TRANSMISSION SYSTEMS. 3(3-0-6) (Prerequisites: 304-334 and 304-361) Operating principles of controllers of flexible AC transmission systems (FACTS). Transformer, thyristor and gate- turn- off thyristor (GTO) technologies. Modulation methods: harmonic elimination, pulse width modulation. Applications in: shunt and series advanced static VAr Controllers (ASVC), phase shifters, unified power flow controllers (UPFC).

304-560A POWER SYSTEMS ANALYSIS II. 3(3-0-6) (Prerequisite: 304-464) Main power system analysis tools for system and component design. Balanced and unbalanced operation of three-phase systems, symmetrical components, fault analysis, transient behaviour due to switching and lightning. Applications for a wide range of typical situations such as line design, circuit breaker rating, protective relaying, and insulation coordination are covered.

● **304-562A CONTINUUM ELECTROMECHANICS.** 3(3-0-6) (Prerequisite: 304-352)

304-563B POWER SYSTEMS OPERATION AND PLANNING. 3(3-0-6) (Prerequisite: 304-361) Design and operation of large scale power systems: Temp oral, spatial and hierarchical decomposition of tasks. Local vs. distributed control. Load-frequency control. Voltage and speed regulation. Interconnected power systems. Power flow. Security states. Optimal operation of power systems. Power system reliability.

304-565A INTRODUCTION TO POWER ELECTRONICS. 3(3-0-6) (Prerequisite: 304-334) Semiconductor power switches – thyristors, GTO's, bipolar transistors, MOSFET's. Switch mode power amplifiers. Buck and boost principles. Modulation methods – PWM, delta, hysteresis current control. Rectifiers, inverters, choppers.

304-571B OPTOELECTRONIC DEVICES. 3(3-0-6) (Prerequisites: 304-304, 304-305, 304-352 and 304-533) Physical basis of optoelectronic devices including Light Emitting Diodes, semiconductor optical amplifiers, semiconductor lasers, quantum well devices, and solid state lasers. Quantitative description of detectors, optical modulation, optical logic devices, optical interconnects, and optomechanical hardware. Photonic systems applications will be addressed.

304-573A MICROWAVE ELECTRONICS. 3(3-0-6) (Prerequisite: 304-432 or 304-533) Physical basis of modern microwave devices and circuits. Microwave transistors and tunnel diodes, transferred electron devices, transit time devices and infra red devices. Microwave generation and amplification, microwave FET circuits. Noise and power amplification.

● **304-578A CRYSTALS AND CONDUCTION.** 3(3-0-6) (Prerequisite: 304-432 or 304-533)

● **304-579B PROPERTIES OF SOLIDS.** 3(3-0-6) (Prerequisite: 304-376)

● **304-596B OPTICAL WAVEGUIDES.** 3(3-0-6) (Prerequisite: 304-352)

● **304-602A OPTIMIZATION METHODS.** 4(3-0-9) (Prerequisite: 304-501 or 304-502)

● **304-604B LINEAR STOCHASTIC SYSTEMS II.** 4(3-0-9) (Prerequisite: 189-587)

● **304-606B ADVANCED TOPICS CONTROL.** 4(3-0-9)

304-610B WIRELESS TELECOMMUNICATIONS. 4(3-0-9) (Prerequisite: 304-511) An introduction to the theory and technology of wireless networks, with the emphasis on networking. Topics include channel modelling, cellularity and frequency reuse, the multiple access problem, services integration, flow control, diversity, smart antennas and aspects of wireless network management. First and second generation systems are described in detail.

304-615B DIGITAL SIGNAL PROCESSING II. 4(3-0-9) (Prerequisite: 304-510 or 304-512) Filter banks, multi-rate signal processing, multi-resolution analysis and wavelets, transform coding. Second-order stochastic processes: Wold decomposition, spectral analysis, power spectral estimation and polyspectra, optimum filtering and linear prediction, adaptive filtering, LMS filters, recursive least-square and transform domain techniques.

● **304-620A INFORMATION THEORY AND CODING.** 4(3-0-9) (Prerequisites: 304-411 or 304-511, and 304-510)

304-621B STAT. DETECTION AND ESTIMATION. 4(3-0-9) (Prerequisites: 304-411 or 304-511, 304-510) On the processing of signals with ransom components, for applications in pattern recognition, image processing, robotics, telecommunications and control. A framework for statistical decision-making, geometrical representation of optimal strategies, Bayes and minimax rules, hypothesis testing, sequential decision-making, parameter estimation, Qiener and Kalman filtering, tracking, estimation of power spectra.

304-623B DIGITAL COMMUNICATION II. 4(3-0-9) (Prerequisite: 304-510, 304-521) Adaptive channel equalization: the LMS algorithm, recursive Least-Squares algorithms, blind equalization. Multipath fading channels: channel characterization and models, diversity techniques for slowly fading channels, detection techniques for frequency selective channels. Spread Spectrum Communications: direct sequence and frequency hopping, multiple access techniques, single and multi-user demodulation techniques. Multi-carrier systems.

● **304-624B DATA COMPRESSION.** 4(3-0-9) (Prerequisites: 304-510 and 304-412 or 304-512)

● **304-625B TELECOM. NETWORK DESIGN.** 4(3-0-9) (Prerequisites: 304-510, 304-528)

● **304-626B COMPUTER VISION.** 4(3-0-9) (Prerequisite: 304-529)

● **304-629B VISUAL MOTOR SYSTEMS.** 4(3-0-9) (Prerequisite: 304-529)

304-634B ANALOG INTEGRATED CIRCUITS FOR SIGNAL PROCESSING. 4(3-0-9) (Prerequisites: 304-334, 304-303 or equivalent) Analog signal processing techniques for monolithic implementation. Filter approximation theory; filter realization methods; integrated filter technologies; active-RC, MOSFET-capacitor, transconductance-capacitor, switched-capacitor, switched-current; filter tuning methods. Phase-locked loops; signal conversion techniques. (Awaiting University Approval)

▭ **304-648B VLSI DESIGN.** 3(1-5-3) (Prerequisite: 304-548) A project course with the opportunity to apply the knowledge acquired in 304-548 to the design of a complete digital IC of medium complexity. Completed designs will be submitted for fabrication to the Implementation Centre of the Canadian Microelectronics Corporation. The course includes lectures on advanced topics in VLSI design.

304-649B VLSI TESTING. 4(3-0-9) (Prerequisite: B.Eng. or equivalent.) The course is to orient designers of VLSI chips and boards to think about testing problems in parallel with the design process. Consideration in structured design-for-testability as a requirement for complex systems will be emphasized; as well as the emerging concept of built-in self-test (BIST).

304-651A,B,C PROJECT RESEARCH I. 1(0-0-3)

304-652A,B,C PROJECT RESEARCH II. 2(0-0-6)

304-653A,B,C PROJECT RESEARCH III. 3(0-0-9)

304-654A,B,C PROJECT RESEARCH IV. 4(0-0-12)

304-655A,B,C PROJECT RESEARCH V. 5(0-0-15)

304-656A,B,C PROJECT RESEARCH VI. 5(0-0-15)

● **304-659Y ELECTRICAL AND THERMAL TRANSIENTS.** 4(4-0-8) Effects of transients on the design and performance of power system components (generators, transformers, conductors, switching devices, reactors, capacitors, motors and other loads). Unbalanced loads, voltage flicker and other abnormal voltage conditions will also be treated. Economic aspects and reliability.

● **304-661Y NEW POWER GENERATION TECHNOLOGIES.** 4(4-0-8)

● **304-662X ELECTRIC MACHINE DYNAMICS.** 4(4-0-8) (Prerequisite: 304-462)

● **304-664X HVDC POWER TRANSMISSION.** 4(4-0-8)

● **304-668Y ENERGY EFFICIENT POWER SYSTEMS.** 4(4-0-8)

● **304-675A SOLAR CELLS AND JUNCTIONS.** 4(3-0-9) (Prerequisite: 304-432)

304-677A,B EXPERIMENTAL TECHNIQUES IN SOLID STATE. 4(0-6-6) (Prerequisite: 304-545) Experimental project in solid state involving the following: techniques of preparation, fabrication and orientation of samples and structures for experimental study; use of special laboratory apparatus; measurement of electronic, optical and structural properties of samples and structures; evaluation of electronic behaviour and performance; interpretation of relevant physical processes and phenomena.

● **304-678A SPECIAL TOPICS IN SOLIDS I.** 4(3-0-9) (Prerequisite: 304-432A)

304-680A,B TOPICS IN PHOTONICS. 4(3-0-9)

304-681A,B COLLOQUIUM IN ELECTRICAL ENGINEERING. (4) Directed reading, seminar and discussion course in various subjects of current interest in electrical engineering research.

304-682A,B TOPICS IN COMPUTERS AND CIRCUITS. 4(3-0-9)

304-683A,B TOPICS IN VISION AND ROBOTICS. 4(3-0-9)

304-684A,B TOPICS IN COMPUTER AIDED DESIGN. 4(3-0-9)

304-685A,B TOPICS IN POWER ENGINEERING. 4(3-0-9)

304-686A,B TOPICS IN COMMUNICATIONS SYSTEMS. 4(3-0-9)

304-687A,B TOPICS IN MICROWAVES & OPTICS. 4(3-0-9)

304-688A,B RECENT ADVANCES IN ELECTRICAL ENGINEERING. 4(3-0-9) Course content suited to the area of specialization of the lecturer.

304-689A,B RECENT ADVANCES IN ELECTRICAL ENG. II. 4(3-0-9) Course content suited to the area of specialization of the lecturer.

304-690A,B TOPICS IN BIOMEDICAL ENGINEERING. 4(3-0-9)

304-691A,B,C THESIS RESEARCH I. 4(3-0-9)

304-692A,B,C THESIS RESEARCH II. 4(3-0-9)

304-693A,B,C THESIS RESEARCH III. 4(3-0-9)

304-694A,B,C THESIS RESEARCH IV. 4(3-0-9)

304-695A,B,C THESIS RESEARCH V. 4(3-0-9)

304-696A,B,C THESIS RESEARCH VI. 4(3-0-9)

304-697A,B,C THESIS RESEARCH VII. 4(3-0-9)

304-701A,B,C PH.D. QUALIFYING EXAMINATION. Oral Examination of Ph.D. student's background in defined areas.

304-702A,B,C PH.D. RESEARCH PROPOSAL. Definition of a plan for Ph.D. research.

The Graduate Units section is divided into six parts, for access to the others click on the link below to return to the Front Page of the Calendar.