43 Library and Information Studies

Graduate School of Library and Information Studies
McLennan Library Building
3459 McTavish Street
Montreal, Quebec, Canada H3A 1Y1

Telephone (514) 398-4204
Fax: (514) 398-7193
Email: AD27@MUSICA.MCGILL.CA
Website: http://www.gslis.mcgill.ca

Director — Jamshid Beheshti

43.1 Staff

Emeritus Professors
Effie C. Astbury; B.A., B.L.S.(McG.), M.L.S.(Tor.).
Violet L. Coughlin; B.Sc., B.L.S.(McG.), M.S., D.L.S.(Col.)

Professor
J. Andrew Large; B.Sc.(Lond.), Ph.D.(Glas.), Dip.Lib.(Lond.)

Associate Professors
Jamshid Beheshti; B.A.(S.Fraser), M.L.S., Ph.D.(W.Ont.)
John E. Leide; B.S.(M.I.T.), M.S.(Wis.), Ph.D.(Rutg.)
Peter F. McNally; B.A.(W.Ont.), B.L.S., M.L.S., M.A.(McG.)
Diane Mittermeyer; B.A., B.L.S.(Montr.), M.L.S., Ph.D.(Tor.)
Lorna Rees-Potter; B.A.(U.N.B.), M.L.S.(McG.), Ph.D.(W.Ont.)

Assistant Professor
France Bouthillier; B.Ed.(U.Q.A.M.), M.B.S.I.(Montr.), Ph.D.(Tor.)

Professional Associate
Andre Boudreau; B.A.h.(Tor.), M.L.I.S.(McG.)

Faculty Lecturers
Gordon Burr; B.A., M.L.I.S.(McG.); Senior University Archivist, McGill
Louise Carpentier; B.L.S.(Tor.), M.Bibl.(Montr.), M.P.P.P.A.(C'dia); Senior Librarian, Head, Government Documents and Special Collections Services, Webster Library, Concordia
Lisa Goddard; B.A.(Queen's), M.L.I.S.(McG.); Librarian, Marianoplis
Sharon Grant; B.A.(C'dia), M.L.I.S.(McG.); Reference Librarian, Health Sciences Library, McGill
Luc Grondin; B.Sc.(U.Q.A.C.), M.Sc.(Laval), Ph.D.(Montr.), M.L.I.S.(McG.); Librarian, Bibliothèque des sciences, U.Q.A.M.
Haidar Moukdad; B.A.(Lebanese), M.A.(Boston), M.L.I.S.(McG.), Ph.D. Candidate, McGill
Richard Virr; B.A.(Tulane), M.A.(Queen's), Ph.D.(McG.); Curator of Manuscripts, Rare Books and Special Collections, McGill

43.2 Programs Offered

The School is an institutional member of the Association for Library and Information Science Education (ALISE) and the Canadian Council of Library Schools (CCLS).

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

The M.L.I.S. degree is awarded after successful completion of the equivalent of two academic years of graduate study (48 credits). Four courses in each of the fall and winter semesters constitute a full load. Although the program is normally taken full-time, it may be pursued part-time but must be completed within five years of initial registration.

Graduate Diploma in Library and Information Studies

The Graduate Diploma Program provides professional librarians and information specialists with formal, for credit continuing education opportunities to update, specialize, and redirect their careers for advanced responsibility. For those considering admission into the Doctoral Program, it will provide an opportunity to develop further their research interests.

The 30-credit program may be completed in one calendar year. The program may also be completed on a part-time basis to a maximum of five years.

Ph.D. *(Ad Hoc)*

The Ph.D. Program provides an opportunity to study interdisciplinary research topics at the doctoral level. The candidate is attached to the Graduate School of Library and Information Studies and develops the usual working relationships with research supervisors.

Continuing Education

Workshops and seminars are organized to meet particular local needs.

Continuing education opportunities apart from regular courses are announced in news releases and special mailings. Individuals or institutions wishing to receive the brochures should contact the School and request to be placed on the mailing list.

Teaching and Research Facilities

The Information Technology Laboratory is designed to enhance the School's commitment to excellence in teaching and research. A local area network (LAN) supports 35 stations, 20 in the IT and cataloguing labs and 15 in faculty and staff offices. Multimedia workstations allow for CD-ROM and demonstration software evaluations. Classrooms are also connected to the LAN. A variety of software packages are available on the LAN for instructional purposes and individual use. A CD-ROM tower is connected to the LAN providing simultaneous access to seven major bibliographic databases. These databases are selected from the lab's collection of over seventy CD-ROM titles.

Recognizing the paramount importance of Internet connectivity in libraries and information centres, the School's LAN is connected to the University backbone (or Campus Wide Area Network) which provides McGill's link to the world. This allows students and staff access to the virtually unlimited resources available on the Internet, including online public access catalogues (OPACs) of libraries around the world, World Wide Web, telnet, ftp and gopher sites.

McGill Library System – Students have access to one of the continent's major research resources in the McGill Library System, which consists of fifteen libraries organized into five administrative units: Humanities and Social Sciences Library, Branch Libraries, Law Area Library, Life Sciences Area Libraries, and the Physical Sciences & Engineering Area Libraries. Altogether these libraries house over two million volumes providing a valuable collection for research and study.

The Library and Information Studies Collection – The Library and Information Studies collection includes almost 40,000 monographs and around 700 periodical titles. The bulk of the collection is in the Humanities and Social Sciences Area Library, located in the same building as the School.

Archives – Located on the same floor of the McLennan Library Building as the School, the McGill University Archives preserves and makes available to researchers of all disciplines more than 2400 m of primary documentation of permanent value generated over the past 180 years. It offers laboratory conditions for students doing independent studies or practical projects for the Archival Science and Records Management courses and serves as a Practicum site. Its central microfilm unit is responsible for all microfilming projects throughout the University and allows students to become familiar with micrographics and other technologies relevant to non-print media. The Archives also possesses a working library of materials relating to archival science, micrographics and records management.

43.3 Admission Requirements

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

1. Applicants must have a bachelor's degree from a recognized university. Academic standing of at least B, or second class, upper division, or a CGPA of 3.0 out of 4.0 is normally required.

The School will take into account the character of the applicants' undergraduate studies and their suitability for a career in library and information services.

Courses in library and/or information studies taken before or as part of a B.A., or such courses taken in a school with a program not accredited by the American Library Association, cannot be accepted either as fulfilling the entrance requirement or as credit toward the McGill M.L.I.S.

2. For international students whose working language is not English, a minimum score of 550 on the Test of English as a Foreign Language (TOEFL) is required for admission. English is the School's language of instruction.
3. A knowledge of French or other language as well as English is desirable.
4. Competency in the use of computers is expected, e.g. MS-DOS, word processing such as WordPerfect. In addition it is desirable to be familiar with computer programming and statistics.
5. Previous library experience, while not essential, will be given consideration in assessing an application.

Graduate Diploma in Library and Information Studies

1. Applicants should have a Master's degree in Library and Information Studies from a program accredited by the American Library Association (or equivalent). Admission of students with overseas degrees will be guided by the M.L.I.S. equivalency standards of ALA. Applicants will normally have at least three years' professional experience following completion of the M.L.I.S.
2. Non-Canadian applicants whose mother tongue is not English and who have not completed a degree using the English language will normally be required to submit documented proof of competency in oral and written English, by appropriate examination: eg. TOEFL (Test of English as a Foreign Language) with a minimum score of 580, or the equivalent in other tests.

Ph.D. *(Ad Hoc)*

1. An applicant should normally have a Master's degree in Library and Information Studies (or equivalent). Master's degrees in other fields will be considered in relation to the proposed research.

   An applicant with a Master's degree in Library and Information Studies (or equivalent) will normally be admitted as a Special Student. A maximum of 12 credits may be taken as a Special Student.

   An applicant with a master's degree in another field will normally be admitted as a Qualifying Student. A Qualifying Student must be registered full-time (12 credits per term) up to a maximum of two terms.
2. A non-Canadian applicant whose mother tongue is not English and who has not completed an undergraduate degree through the medium of English will normally be required to submit documented proof of competency in oral and written English such as a TOEFL score of at least 580. An applicant who has not attained this competency level may be required to take language courses while at McGill to upgrade their language ability.

43.4 Application Procedures

All applicants must submit, or arrange for the submission of, the following documents, directly to the School:

1. A completed application form, which may be obtained from the School.
2. Official transcripts of the applicant's university record.
3. A bank draft, money order or certified cheque in the sum of $60 in Canadian funds (payable to McGill University). This application fee is non-refundable.
4. A curriculum vitae.
5. Two letters of recommendation.
6. A covering letter outlining the reasons for wishing to undertake the program of study.

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

Deadline for receipt of application forms for entrance into the first year of the M.L.I.S. program is May 1 (April 1 for overseas students), but as enrolment is limited, early application is strongly recommended.

Applicants may be interviewed by a member of the Admissions Committee or a delegate.

Graduate Diploma in Library and Information Studies

Applicants must also provide a statement of areas of academic/research interest.

Applications will be accepted for the Fall, Winter and Summer Sessions. The application deadline is three months prior to commencement but earlier applications are encouraged.

Ph.D. *(Ad Hoc)*

Applicants must also provide a brief outline (2-3 pages) of the proposed research.

The applicant's file will be considered by the Advanced Studies Committee within the School. If approved, the applicant will normally enrol as a Special or Qualifying Student. In exceptional circumstances the candidate may be allowed to proceed immediately to submission of the research proposal.

Admission as a Special or Qualifying Student does not guarantee admission to the Ph.D. *(Ad Hoc)* Program. This decision is made by the Faculty of Graduate Studies and Research upon submission of a completed research proposal and a program of study.

A person interested in pursuing a program of study leading to the Ph.D. degree should contact the Chairperson of the Advanced Studies Committee in the Graduate School of Library and Information Studies.

43.5 Program Requirements

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

The M.L.I.S. degree is awarded after successful completion of the equivalent of two academic years of graduate study (48 credits). Twelve credits in each of the fall and winter semesters constitute a full load. Although the program is normally taken full-time, it may be pursued part-time but must be completed within five years of initial registration.

Goals of the M.L.I.S. Program

1. To provide the intellectual foundation for careers in library and information service.
2. To foster adaptability and competence in managing information resources.
3. To promote appropriate use of technologies to meet the needs of a changing world.
4. To emphasize the role of research in the advancement of knowledge.
5. To promote commitment to professional service for individuals, organizations and society.

Objectives of the M.L.I.S. Program

Students graduating from the program will be able to:

1. Demonstrate an understanding of the history and intellectual foundations of librarianship and information science.
2. Articulate the issues concerning access to information, privacy, censorship, and intellectual freedom.
3. Analyze the flow of information through society, and the roles of libraries and information agencies in this process.

4. Analyze the role of the librarian or information specialist as a mediator between users and information resources.
5. Assess and respond to diverse users' information needs and wants.
6. Apply principles of selection, acquisition, organization, storage, retrieval and dissemination of information resources.
7. Undertake the design, the management and the evaluation of information systems and services.
8. Apply management theory, principles and techniques in libraries and information agencies.
9. Understand and apply research principles and techniques.
10. Understand the nature of professional ethics and the role of professional associations.

Categories of Students

Full-time M.L.I.S. students:
Those students who are proceeding to the M.L.I.S. degree and who are registered in at least 12 credits per term.

Part-time M.L.I.S. students:
Those students who are proceeding to the M.L.I.S. degree and who are registered in fewer than 12 credits per term.

Graduate Students in other McGill programs:
Students enrolled in graduate programs at McGill other than the M.L.I.S. may register for M.L.I.S. courses with the approval of the course instructor.

Special students:
Individuals who already hold a graduate degree in library and information studies from an accredited program and who are not proceeding to a degree may register for up to 6 credits per term to a maximum of 12 credits, for which they fulfil the necessary prerequisites. At the discretion of the Director, work experience may be substituted for such prerequisites. Enrolment is subject to the condition that regular students have priority in cases of class size restrictions.

Required Courses (24 credits)

405-601	(3)	Information and Society
405-607	(3)	Organization of Information
405-611	(3)	Research Principles and Analysis
405-615	(3)	Bibliographic and Factual Sources
405-616	(3)	Online Information Retrieval
405-617	(3)	Information System Design
405-618	(3)	Information Users and Services
405-620	(3)	Information Agency Management

It is strongly recommended that students complete the required courses in the program as soon as possible.

Elective Courses (24 credits)
Students may, in consultation with their advisors, design individualized programs of instruction that take advantage of their backgrounds and interests to prepare them for specialized careers. During their first term of study while they are following the required courses, students should start to investigate their options and discuss their plans with their faculty advisors.

Many courses include visits to libraries and information centres, as well as a variety of other information-related organisations.

Not all courses can be offered in any academic year. In addition, courses which have a registration of fewer than five will not normally be taught.

Courses Outside the School

Courses in Other McGill Departments
McGill University offers a large number and variety of graduate-level courses. Students interested in taking a course outside the School must complete the following steps:

a) contact the relevant instructional unit to establish any prerequisites and to ascertain how the unit handles outside registrants;
b) obtain a current course outline;
c) demonstrate in writing the value of the selected course within the context of an integrated program of study leading to the M.L.I.S. degree;
d) gain the approval of their faculty advisor and the School's Director.

Courses in Other Quebec Universities
Students may take up to six credits at any other Quebec university provided the courses are not available at McGill University. Steps a) to d) outlined above should be followed by any student wishing to pursue this option.

Transfer Credits – Advanced Standing

Students may not count credits for courses taken toward another degree as credits towards the M.L.I.S. degree. In special cases credits for appropriate courses previously taken outside the School may be transferred to the M.L.I.S. program, but only with the approval of the Director, and only if negotiated at the time of admission to the program. As a rule, no more than one-third of the McGill program course work (not thesis or project) can be credited with courses from another university.

Transfer credits must be approved by the Director of the School and the Director of Graduate Studies of the Faculty of Graduate Studies and Research. Requests for transfer credits will only be considered at the time of admission to the M.L.I.S. program.

In special cases, students may be excused from taking a required course if they have already completed an equivalent course. In such cases, however, they must obtain the permission of the instructor and the Director and will be required to substitute an additional elective course bringing the total of their earned credits in the M.L.I.S. program to the normal forty-eight.

Research Colloquia
Research Colloquia presented by guest speakers from Canada and, on occasion, other countries, are open to students, as well as university staff and the Montreal information community at various intervals throughout the year. Although not a formal part of the M.L.I.S. program, the Colloquia offer an opportunity for students to learn of current research preoccupations and developments in the field of library and information studies.

43.5.2 Graduate Diploma in Library and Information Studies

The program may be completed in one calendar year. The program may also be completed on a part-time basis to a maximum of five years.

Each diploma student will be assigned a faculty advisor in conjunction with whom an individualized program of study will be designed.

Program Requirements (30 credits)

Research (maximum of 18 credits)
at least one of:

405-695	(6)	Research Paper I
405-696	(12)	Research Paper II

All research proposals require approval of the Committee on Student Standing and Academic Affairs.

The remaining credits (12 - 24) are to be chosen in consultation with the student's advisor(s) from any of the GSLIS courses (except 405-646 Research Project, 405-647 Independent Study).

Up to 15 credits may be taken outside the School in other McGill graduate programs that students are qualified to enter.

Students may take no more than one-third of the course credits in another university, subject to the approval of their advisors and the Director.

43.5.3 Ph.D. *(Ad Hoc)*

Applicants to the Ph.D.*(Ad hoc)* program normally enrol as a Special or Qualifying Student. In exceptional circumstances the candidate may be allowed to proceed immediately to submission of the research proposal.

An applicant with a Master's degree in Library and Information Studies (or equivalent) could be admitted as a Special Student. A maximum of 12 credits may be taken as a Special Student.

An applicant with a Master's degree in another field will normally be admitted as a Qualifying Student. A Qualifying Student must be registered full-time (12 credits per term) up to a maximum of two terms.

The Ph.D. Program provides an opportunity to study interdisciplinary research topics at the doctoral level. The candidate is attached to the Graduate School of Library and Information Studies and develops the usual working relationships with research supervisors. In addition to a supervisor from the School, three faculty must sit on the Advisory Committee, one of whom must be external to the School.

Admission, program planning and research progress in the Ph.D. *(Ad Hoc)* Program is the responsibility of the Faculty of Graduate Studies and Research.

The residency is 3 years (6 terms).

Admission to the Ph.D. *(Ad Hoc)* Program involves a number of steps.

1. The applicant normally is initially admitted as a Special or Qualifying Student in order to prepare a detailed research proposal.
2. An academic advisor from the School will assist the student in program planning and in preparing the research proposal. The student should be aware that the preparation of the proposal involves considerable time. A Special or Qualifying Student may not be eligible for support by government doctoral fellowship programs. It is the student's responsibility to establish eligibility with the relevant authorities.
   The completed research proposal should clearly state the problems to be studied. It should usually be prefaced by a brief account of the research trends which have led to the isolation of the problem and should include an indication of the methodology which will be used. The length of the proposal should be approximately 10 pages. A selected bibliography of relevant recent works should be appended.
3. At least one faculty member from another department with a Ph.D. program is required to sit on the admissions committee for the student and advise the student throughout the Ph.D. (Ad Hoc). The student (together with the academic advisor) is responsible for contacting relevant departments and faculty who have familiarity with the proposed research area and have experience in directing graduate study.
4. The Associate Vice-Principal (Graduate Studies) of the Graduate Faculty is notified that an application to enter the Ph.D. *(Ad Hoc)* program has been completed and the Executive Committee of the Graduate Faculty examines the request.
5. The submission to the Executive Committee includes an application form, updated curriculum vitae, the research proposal and the report of the Admissions Committee. The form "Requirements for Graduation of Ad Hoc Ph.D. Candidates" will be completed providing information on the candidate, required courses, required examinations (comprehensive, language, etc.) and the signatures of the Admissions Committee members.
6. The Executive Committee considers requests for admission to *Ad Hoc* programs at their meetings in May, September, and December.
7. The Executive Committee endorses or rejects the recommendation of the Admissions Committee. If the applicant is accepted for admission, an Advisory Committee will be appointed which may include members of the Admissions Committee or new members as deemed necessary.

43.6 Courses

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

405-601 INFORMATION AND SOCIETY. (3) Introduction to our world of information, documents and information agencies with historical and social approach. A look at how information is generated and at the role played by libraries and of all kinds and other relevant agencies. This course should provide a broad framework within which other required or elective courses could be understood.

405-607 ORGANIZATION OF INFORMATION. (3) Theory and techniques of bibliographic control for information. Basic cataloguing and indexing principles and practices incorporating the concepts of main entry, subject analysis, and classification according to standard codes. Introduction to ISBD and MARC formats for description and automated support applications. Practical assignments in the organization of materials laboratory.

405-608 CLASSIFICATION AND CATALOGUING. (3) (Prerequisite: 405-607) Cataloguing in depth with a view to such specialties as original cataloguing, catalogue maintenance, and administration of the cataloguing department. Investigation of alternative methods of library documentation. The study of developments in international cataloguing standards, codes, and formats. Includes laboratory sessions.

405-611 RESEARCH PRINCIPLES AND ANALYSIS. (3) Fundamental aspects of reflective thinking and the methods and techniques of research appropriate to the investigation of library/information problems. Criteria helpful in evaluating published research in library/information studies by analyzing the various steps of the research process, thereby providing guidelines for planning, conducting, and reporting research.

405-612 HISTORY OF BOOKS AND PRINTING. (3) (Prerequisite: 405-615 or consent of instructor.) Surveyed are the development of writing, alphabets, and books from their inception, and of printing from its invention in the fifteenth century. Historical bibliography dealing with the various physical elements in book production, including design.

405-613 HISTORY OF LIBRARIES. (3) (Prerequisite: 405-601 or consent of instructor). Covered is the history of libraries and librarianship from the ancient world to the present with particular emphasis upon Quebec and Canada. This historical evolution will be discussed in terms of: forms of knowledge transfer, information technology, print culture, and comparative librarianship.

405-614 PUBLIC LIBRARIES. (3) A review of the Public Library Movement in English and French Canada. The development of public libraries in North America over the last twenty years with an emphasis on the library's role and responsibilities for the future. The impact of information technologies on the definition and delivery of services.

405-615 BIBLIOGRAPHIC AND FACTUAL SOURCES. (3) Introduces students to the theory, principles, and practice of biliographical control as a foundation for reference service and information retrieval. Paper-based, microform, and electronic bibliographies are introduced. The creation and use of bibliographies, within various context, are discussed.

405-616 ONLINE INFORMATION RETRIEVAL. (3) Focuses on the principles and methods of information retrieval from full-text and bibliographic databases. Includes information-seeking behaviour, database organisation and characteristics, search and browsing strategies, and search and system evaluation, as applied to online databases, CD-ROMs, OPACs, and internet resources.

405-617 INFORMATION SYSTEM DESIGN. (3) Fundamental concepts of computer technology and its application to the storage and retrieval of information. Includes hardware and software choices, user requirement analysis, information structure analysis, data modelling and interface design as applied to textual information. Students design and construct a small-scale information system.

405-618 INFORMATION USERS AND SERVICES. (3) Exploration of the principles and practices of information transfer. Investigation of information needs, information users and use, and information use environments. The development of information services and col-

lections to meet needs. The evaluation of information services in light of information needs.

405-620 INFORMATION AGENCY MANAGEMENT. (3) Introduction to management theory and decision making in the context of information agencies and services. Emphasis is placed on strategic planning, organizing, quality management, organizational behaviour, human resource management, leadership and communication, management of change, legal issues in information agencies, and information use in decision making.

405-622 INFORMATION SERVICE PERSONNEL. (3) (Corequisite: 405-620) An examination of key issues in human resource management for service provision in libraries and information centres. Topics include reengineering for service quality, human resource planning, hiring policies and human rights, staff training and development, performance appraisal supervision, staff motivation, occupational health and safety, negotiation and conflict management.

405-623 FINANCIAL MANAGEMENT. (3) (Corequisite: 405-620) Principles and practices of financial management for library and information services. Emphasis is placed on the communication of financial information and use of spreadsheets. Topic include: financial planning; budgeting; cost management; cost-benefit, cost-effectiveness and break-even analysis; accounting basics; strategies for financing services; and the value of information.

405-624 MARKETING INFORMATION SERVICES. (3) The role and use of marketing for information brokers and library or information centres are discussed. Various aspects of the marketing process as applied to information services are analyzed. Students prepare a preliminary marketing plan for an information service of their choice and share similarities and differences in these specific applications.

405-631 SYSTEMS THINKING. (3) (Prerequisite: Consent of the instructor) Introduction to general systems thinking and the use of the systems approach as an aid to problem solving and decision making. Subjective and objective factors in modelling for the definition, analysis, design, implementation and evaluation of alternative solutions.

405-632 LIBRARY SYSTEMS. (3) (Prerequisite: 405-617) Focuses on applied systems analysis and project management techniques in an operational environment. Includes an in-depth examination of hardware and software installations, LANs, RFPs, automation, system selection, Internet and Intranet applications, and standards for exchanging digital information.

405-633 MULTIMEDIA SYSTEMS. (3) (Prerequisites: 405-617 and consent of instructor). Theoretical and applied principles of multimedia systems design. Includes knowledge representation; interfaces; storage and retrieval of text, sound, still images, animation and video sequences; authoring software; hardware options; CD-ROM/DVD and Web based systems; virtual reality; testing and evaluation. Students design and develop a small-scale system.

405-636 GOVERNMENT INFORMATION. (3) (Prerequisites: 405-615, 405-616) An introduction to the structure of governments, and the nature and variety of government information. Emphasis is placed on the governments of Canada, the provinces, the United States and selected international governmental organizations. Topics include the acquisition, organization, bibliographic control and use of government information.

405-637 SCIENTIFIC AND TECHNICAL INFORMATION. (3) (Corequisites: 405-615, 405-616) Examination of the process of communication and information requirements (of/in) the scientific community; study of primary, secondary, and tertiary sources of information in the physical, biological, and applied sciences. Study and application of new information technologies, and in particular the World Wide Web, as used in scientific and technical communication.

405-638 BUSINESS INFORMATION. (3) (Corequisites: 405-615, 405-616) A survey of the literature used in business including bibliographic and non-bibliographic data bases. Various aspects of business set the scene for a study of the literature. Students examine key publications, and learn to select a basic business bibliography and to do reference work in the field.

405-639 CORPORATE INFORMATION CENTRES. (3) (Prerequisite: 405-601) A management course on strategic planning for corporate information services. Using a simulation, the class establishes and operates a corporate information centre in a business setting through human resource development, physical planning, service development, application of information technologies and development of an evaluation plan.

405-644 DESCRIPTIVE BIBLIOGRAPHY. (3) (Prerequisite: 405-615) A practical course on the history, description and care of rare books and antiquarian material. The principles of descriptive bibliography will be presented in the context of book culture. The place of rare book collections in research libraries and the practical administration of a rare book department will be examined.

405-645 ARCHIVAL STUDIES. (3) Introduction to the principles and practices of archival studies. The course exposes students to basic problems and solutions involved in dealing with archival resources. Main subjects include descriptive studies, acquisition, appraisal, arrangement, finding aids, preservation, public service and electronic records.

Note: Advanced work in archival science is available to a few students who do well in the introductory course. It is elected as Independent Study, and requires prior consultation with the University Archivist and the Director.

405-646 RESEARCH PROJECT. (12) (Prerequisite: 405-611) A 2-term in-depth research study leading to the preparation of a research paper with potential for publication. The subject of the study will vary according to the student's interests and pre-supposes some detailed background knowledge in the area to be researched. Working with a faculty supervisor, the student will plan, conduct and document a piece of research.

405-647 INDEPENDENT STUDY. (6) (Prerequisite: 405-611) An in-depth exploration of a topic in library and information studies which is not emphasized or elaborated in any other part of the curriculum. The subject will vary according to the student's interests. It may be a work of synthesis, a research paper of limited scope, a state-of-the-art paper or a project which is an outgrowth of course work or in an area not covered in the curriculum. The student will work with a faculty supervisor to plan and pursue an individualised program of study.

405-648 QUANTITATIVE METHODS AND BIBLIOMETRICS. (3) (Prerequisite: 405-611) Introduces the student to data gathering, analysis, and interpretation with a primary emphasis on quantitative methodology. Introduction to bibliometric models and empirical investigation in library and information science.

405-651 HUMANITIES AND SOCIAL SCIENCE INFORMATION. (3) (Prerequisites: 405-615, 405-616) This course investigates the structure of knowledge in the humanities and social sciences and their constituent disciplines in order to understand how information and knowledge in these fields is created, organized, communicated and retrieved.

405-655 LANGUAGE AND INFORMATION. (3) (Prerequisite: 405-616). An explanation of the relationship between language and information science through consideration of: document representations for information retrieval; bilingual/multilingual systems; natural language processing; language barriers to information transfer.

405-656 ABSTRACTING AND INDEXING. (3) (Prerequisite: 405-607) Principles and practical methods of abstracting and indexing. Topics include pre- and post-coordinate indexing, concept analysis, vocabulary control, construction and evaluation of thesauri and of indexes for books, periodicals, and series; emphasis on the role of the computer in indexing.

405-658 ONLINE INFORMATION INDUSTRY. (3) (Prerequisite: 405-616) An indepth examination of online information systems, database producers, and vendors in order to understand the dynamics

of the industry, problems, processes affecting library services and future directions.

405-660 INFORMATION RESOURCE MANAGEMENT. (3) (Prerequisite: 405-607) Concepts and practices of managing information resources in organizations; management of records in all media; information inventories and information flow analysis; life-cycle management; application of information resource technologies for storage, retrieval and management; evaluation of information resource policies and practices; managing information resources for ISO 9000 compliance.

405-671 HEALTH SCIENCES INFORMATION. (3) (Prerequisite: 405-615, Corequisite: 405-616) A survey of information services and sources (both electronic and print) for health care professionals and the general public. An exploration of the information needs of health professionals and scientists; the role of health libraries and librarians; principles of health and biomedical library practice, functions, and management.

405-672 LAW INFORMATION. (3) (Prerequisite: 405-615. Corequisite: 405-616) The nature and scope of law librarianship and legal information sources; examination of the organization of legal knowledge, the legal research process, law information sources both print and electronic.

405-689 SELECTED TOPICS IN LIBRARY AND INFORMATION STUDIES. (3) (Corequisite: 405-601) To explore a topic in library and information studies which elaborates or augments the curriculum; to pursue an individualized program of directed study which will vary according to the student's interests.

405-690 INFORMATION POLICY. (3) (Prerequisite: 405-601) Information societies are examined from a global perspective, emphasising political, economic, social cultural and ethical issues including the roles of government and the private sector in providing information systems and services, transborder data flow, information access at personal, institutional and national level, censorship, copyright and data security.

405-691 SPECIAL TOPICS IN LIBRARY AND INFORMATION STUDIES I. (3) Seminar to explore topics of particular interest to library and information studies. Topics vary from year to year.

405-692 SPECIAL TOPICS IN LIBRARY AND INFORMATION STUDIES II. (3) Seminar to explore topics of particular interest to library and information studies. Topics vary from year to year.

405-693 SPECIAL TOPICS IN LIBRARY AND INFORMATION STUDIES III. (3) Seminar to explore topics of particular interest to library and information studies. Topics vary from year to year.

405-695 RESEARCH PAPER I. (6) Explores a minor topic relevant to the Graduate Diploma student's program of study and results in a scholarly paper with potential for publication.

405-696 RESEARCH PAPER II. (12) Explores a major topic relevant to the Graduate Diploma student's program of study which results in a scholarly paper with potential for publication.

405-699 PRACTICUM IN INFORMATION SERVICES. (3) (Prerequisites: Successful completion of 36 credits of course work, including all required courses, and permission of Practicum coordinator.) Allows students to apply their theoretical knowledge base in an information environment and to learn basic professional skills. Each practicum is planned to ensure that the student has an overview of information processes. The precise nature of each practicum will vary to the type of site and student's interests.

44 Linguistics

Department of Linguistics
1085 avenue Dr. Penfield
Montreal, QC
Canada H3A 1A7
Telephone: (514) 398-4222
Fax: (514) 398-7088

Chair — M. Paradis

44.1 Staff

Professors
M. Paradis; B.A.(Montr.), M.A., Ph.D.(McG.), Ph.D.(Montr.)
L. White; M.A.(Cantab.), Ph.D.(McG.)

Associate Professors
B. Gillon; B.A., M.A., (Mich.), M.A.(Tor.), Ph.D.(M.I.T.)
H.M. Goad; B.A.(Br.Col.), M.A., Ph.D.(U.S.C.)
G.L. Piggott; B.A.(W.I.), M.A., Ph.D.(Tor.)
L. de M. Travis; B.A.(Yale), Ph.D.(M.I.T.)

Assistant Professors
J.D. Bobaljik; B.A.(McG.), Ph.D.(M.I.T.)
N.G. Duffield; M.A.(Cantab.), M.A.(Lond.), Ph.D.(U.S.C.)

44.2 Programs Offered

M.A. (thesis and non-thesis) and Ph.D.

44.3 Admission Requirements

Applicants to the M.A. or Ph.D. should have completed a B.A. with a specialization in linguistics. Applications are also invited from students with a background in other disciplines. Strong candidates who do not satisfy all requirements may be required to take additional undergraduate courses or may be admitted to a Qualifying Program which permits them to make up the gaps in their background.

44.4 Application Procedures

Applications will be considered upon receipt of:

1. application form
2. transcripts
3. letters of reference
4. statement of purpose
5. test results for international students: TOEFL
6. Application fee of $60.00 (money order or certified cheque in Canadian funds)

Applications should be submitted to the Department of Linguistics not later than February 1st.

44.5 Program Requirements

Degree of Master of Arts

The M.A. degree (with thesis) requires the completion of 48 credits, 24 credits of course work and 24 credits of thesis work.

The M.A. degree (without thesis) requires the completion of 45 credits, 30 credits of course work and a 15 credit research paper.

Degree of Doctor of Philosophy

Candidates holding a B.A. degree will follow a program of at least three years. This will include 30 credits of approved course work, a research seminar and a Comprehensive Evaluation to be completed before beginning work on the doctoral thesis.

Candidates holding an M.A. in Linguistics will follow a program of at least two years. This will include a minimum of 12 credits of course work, a research seminar and a Comprehensive Evaluation, to be completed before beginning work on the doctoral thesis.

44.6 Courses

● Denotes not offered in 1999-2000.

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

104-520A TOPICS IN SOCIOLINGUISTICS I. (3) (Prerequisite: 104-325B and permission of instructor.) A seminar on variationist "microsociolinguistics" including a survey of the most important primary literature on sociolinguistic variation and an introduction to sociolinguistic fieldwork. **Staff**

104-530A PHONOLOGY II. (3) (Prerequisite: 104-351B and permission of instructor.) Foundations of autosegmental and metrical phonology. Topics include the representation of tones, syllable structure and syllabification, principles and parameters of stress assignment, an introduction to feature geometry and the characterization of assimilation, and an introduction to optimality theory. **Professor Piggott**

● **104-539A ISSUES IN HISTORICAL LINGUISTICS I.** (3) (Prerequisite: 104-340A and 351B, and 530A which can be taken concurrently, or permission of instructor.)

● **104-541B ISSUES IN HISTORICAL LINGUISTICS II.** (3) (Prerequisite: 104-360A; 104-400A and 571B, which can be taken concurrently or permission of instructor.)

● **104-555B LINGUISTIC THEORY AND LANGUAGE ACQUISITION.** (3) (Prerequisites: 104-321B and 360A and permission of instructor.)

104-560B FORMAL METHODS IN LINGUISTICS. (3) (104-360 and 104-370 or permission of instructor.) This course presents the formal methods used in the study of languages (namely, the theories of sets, relations, functions, partial orders, and lattices as well as the principle of mathematical induction). **Professor Gillon**

104-571B SYNTAX II. (3) (Prerequisite: 104-360A and permission of instructor.) This course extends and refines the theory of grammar developed in Syntax I (104-360A), while focusing on recent developments in certain modules of the grammar such as phrase structure, wh-movement, and binding. **Professor Travis**

104-590A INTRODUCTION TO NEUROLINGUISTICS. (3) (Prerequisite: 12 credits in Linguistics.) An introduction to issues in neurolinguistics and linguistic aphasiology: How language breaks down, and what the pattern of breakdown reveals about normal language and its processing; to what extent elements of language are correlated with particular parts and functions of the brain; the universal and language-specific aspects of deficits. **Professor Paradis**

104-600A,B M.A. RESEARCH SEMINAR I. (3) **Staff**

104-601A,B M.A. RESEARCH SEMINAR II. (3) **Staff**

● **104-621B TOPICS IN SOCIOLINGUISTICS II.** (3)

104-631B PHONOLOGY III. (3) (Prerequisite: 104-530A or permission of instructor.) This course focuses on the role of phonological representations in explaining phenomena. Emphasis is on the principles and parameters governing the relationship between phonological units, and the nature and function of mechanisms like spreading, fusion and epenthesis. **Professor Piggott**

104-640B MORPHOLOGICAL THEORY AND ANALYSIS. (3) Introduction to current theoretical notions that seek to define a well-formed word structure, including headedness, morphological subcategorization, feature percolation and cyclicity. **Professor Bobaljik**

104-655A THEORY OF SECOND LANGUAGE DEVELOPMENT. (3) (Prerequisite: 104-571B, which can be taken concurrently, or permission of instructor.) This course looks at the availability of principles and parameters of Universal Grammar in second language acquisition. **Professor White**

● **104-660B FORMAL SEMANTICS.** (3) (Prerequisite: 104-370 and 104-560 or permission of instructor. At least one course in logic strongly recommended.)

104-671A SYNTAX III. (3) (Prerequisite: 571B or permission of instructor.) Exposure to current topics in syntactic theory through reading and discussion of primary literature. Emphasis will be placed on the logic and development of argumentation in syntactic theory. **Professor Bobaljik**

● **104-675A,B COMPARATIVE SYNTAX.** (3) (Prerequisite 104-571B or permission of instructor.)

104-682A,B SELECTED TOPICS I. (3)

104-683A,B SELECTED TOPICS II. (3)

104-690B TOPICS IN NEUROLINGUISTICS I. (3) (Prerequisite: 104-590A) Topics of current interest in neurolinguistics of bilingualism. **Professor Paradis**

● **104-691B TOPICS IN NEUROLINGUISTICS II.** (3) (Prerequisite: 104-590A)

104-692A,B TUTORIAL ON A SELECTED TOPIC. (3)

104-697D M.A. RESEARCH PAPER. (15)

104-698D M.A. THESIS RESEARCH. (12)

104-699D M.A. THESIS. (12)

104-700D PH.D. RESEARCH SEMINAR. (6)

104-701D PH.D. COMPREHENSIVE EVALUATION. (12)

● **104-720A,B PROBLEMS OF LANGUAGE CONTACT.** (3)

104-731B ADVANCED SEMINAR IN PHONOLOGY. (3) (Prerequisite: 104-631B) **Professor Piggott**

104-740A,B ADVANCED SEMINAR IN MORPHOLOGY. (3) (Prerequisites: 104-640A and 571B) **Professor Bobaljik**

● **104-750A LINGUISTIC THEORY II.** (3)

● **194-755B ADVANCED SEMINAR IN LANGUAGE ACQUISITION.** (3) (Prerequisites: 104-571B and 555A or 655A, or permission of instructor.)

● **104-760A,B ADVANCED SEMINAR IN SEMANTICS.** (3) (Prerequisite: 104-660A)

104-775B ADVANCED SEMINAR IN SYNTAX. (3) (Prerequisite: 104-671A or 675)

104-782A SELECTED TOPICS III. (3)

104-783B SELECTED TOPICS IV. (3)

104-790A TOPICS IN NEUROLINGUISTICS III. (3) (Prerequisite: 104-590A) **Professor Paradis**

● **104-791B TOPICS IN NEUROLINGUISTICS IV.** (3) (Prerequisite: 104-590A)

104-792A,B TUTORIAL ON A SELECTED TOPIC. (3)

104-794A,B TUTORIAL ON A SELECTED TOPIC. (3)

Undergraduate Courses

Students deficient in certain areas may be required to take some of the following undergraduate courses in addition to graduate courses.

104-250 Introduction to Phonetics
104-340 Introduction to Historical Linguistics
104-351 Phonology I
104-360 Syntax I
104-370 Introduction to Semantics and Pragmatics
104-440 Morphology
104-471 Field Methods of Linguistics

45 Management

Faculty of Management
Samuel Bronfman Building
1001 Sherbrooke Street West
Montreal, QC, Canada H3A 1G5
Telephone: (514) 398-4066
Website: http://www.management.mcgill.ca

Dean, Faculty of Management — Wallace Crowston

Associate Dean, Undergraduate Program — A. Duff

Associate Dean, M.B.A.; Director, Master Programs — A.M. Jaeger

Associate Dean, Ph.D. Program — R.J. Loulou

Program Director, Masters Program in Economic Policy Management — Jan Jörgensen

Program Chair, International Masters Program in Practicing Management (IMPM) — Henry Mintzberg

Program Director, Master of Management (Manufacturing) — Vedat Verter

Program Director, McGill/McConnell Voluntary Sector — Frances Westley

Manager, Master Programs — Eva Shepherd

45.1 Staff

Emeritus Professor
D. Armstrong; B.A., B.Com.(Alta.), Ph.D.(McG.)

Professors
N.J. Adler; B.A., M.B.A., Ph.D.(U.C.L.A.); Organizational Behaviour
R. Brenner; B.Sc., M.A., Ph.D.(Hebrew Univ.) *(Repap Professor of Economics)*
W.B. Crowston; B.A.Sc.(Tor.), S.M.(M.I.T.), M.Sc., Ph.D.(Carnegie-Mellon); Management Science
J. Detemple; M.A.(Essec), M.A., Ph.D.(Wharton); Finance
D.H. Drury; B.Com., M.B.A.(McM.), Ph.D.(Northwestern), R.I.A.(S.I.A.); Accounting
V.R. Errunza; B.Sc.(Tech.)(Bombay), M.Sc., Ph.D.(Calif.); Finance
J.L. Goffin; B.Eng., M.S.(Brussels), M.Sc., Ph.D.(Calif.); Management Science
C. Hardy; B.Sc., Ph.D.(Warwick); Strategy & Organization
J. Hartwick; B.A.(W.Ont.), M.A., Ph D.(Ill.); Organizational Behaviour
R.N. Kanungo; B.A., M.A.(Patna), Ph.D.(McG.); Organizational Behaviour
R.J. Loulou; M.Sc., Ph.D.(Calif.); Management Science
H. Mintzberg; B.Eng.(McG.), B.A.(Sir G.Wms.), S.M., Ph.D.(M.I.T.); Strategy & Organization *(John Cleghorn Professor in Management Studies)*
F. Westley; B.A.(Vt.), M.A., Ph.D.(McG.); Strategy & Organization
G.A. Whitmore; B.Sc.(Man.), M.Sc., Ph.D.(Minn.); Management Science *(Samuel Bronfman Professor of Management Science)*
R.W. Wright; B.A., M.B.A.(Dart.), D.B.A.(Ind.); International Business and Finance

Associate Professors
K. Basu; B.Eng.(Calc.), M.Sc.(Flor. Institute of Tech.), Ph.D.(U. of Florida); Marketing; Coordinator, IMPM Program
K. Bawa; B.A.(St.Stephens), Ph.D.(Col.);
Laurette Dubé; B.Sc.(Laval), M.B.A.(HEC), M.P.S., Ph.D.(C'nell); Marketing
J.A. Duff; B.A., M.A.(Cantab.), C.A., F.C.A.; Accounting
H. Etemad; B.S.C.; M.Eng.(Tehran), M.S., M.B.A., Ph.D.(Calif.); International Business
A.M. Jaeger; B.Sc.(Northwestern), M.B.A., Ph.D.(Stan.); Organizational Behaviour
J. Jörgensen; B.A., M.A.(N.C.), Ph.D.(McG.); International Business, Strategy & Organization
M.D. Lee; B.A.(Eckerd), M.Ed.(Temple), M.A.(S.Florida), Ph.D.(Yale); Organizational Behaviour
N. Phillips; B.Sc., M.B.A.(Calg.), Ph.D.(Alta.); Strategy & Organization
E. Sarigöllü; B.A., M.B.A.(Bogazici), M.A., Ph.D.(Penn.); Marketing
D.M. Saunders; B.A.(York), M.A., Ph.D.(W.Ont.); Organizational Behaviour
T. Thomason; B.S., M.A.(Ala.), Ph.D.(C'nell); Labour Management Relations
M. Yalovsky; B.Sc., M.Sc., Ph.D.(McG.); Management Science

Assistant Professors
S. Banerji; B.A., M.A.(Calcutta), Ph.D.(S.U.N.Y./ Buffalo); Finance
S. Basu; B.Sc.(Calcutta), M.A.(Tufts), Ph.D.(Pitt.); General Management
T. Boyaci; B.S.(Middle-East Tech., Turkey), M.S.(Col.); Management Science
Michelle L.Buck; B.A.(Mich.), M.A., Ph.D.(Prin.); Organizational Behaviour
F. Carrieri; Laurea-Law(Universita'di Bari), M.A.(U.S.C.); Finance
B. Choi; B.A.(Korea), M.B.A.(Wash.), Ph.D.(Iowa); Accounting
P. Christofferson; B.A.(Copenhagen), M.A., Ph.D.(Penn.); Finance
S. Christofferson; B.A.(Queen's), M.A.(Br.Col.); Finance
J. Craighead; B.Com.(Mt.All.), G.D.P., Ph.D.(McG.); Accounting
L.P. Gialloreto; B.A.(UWO), M.B.A.(McG.), B.A. Law(Carleton), LL.M.(McG.); Marketing
K. Jacobs; B.A., M.A.(Cath. U. of Louvain), Ph.D.(Pitts.); Finance
L. Lapointe; B.A., M.Sc.,(Mtl), Ph.D.(HEC); Information Systems
S. Li; M.S.(Georgia), Ph.D.(Tex.); Management Science
F. Liu; B.Eng., M.Eng.(Tianjin, China), Ph.D.(C'dia); Finance
S. Maguire; B.Sc.(Queen's), M.B.A.(Br.Col.); Strategy & Organization
C. McWatters; B.A. M.B.A., C.M.A., Ph.D.(Queen's); Accounting
A. Mukherjee; B.Eng.(Jadavpur-India), M.B.A.(Indian Inst. of Mgmt); Marketing
L. Rivera-Batiz; B.A.(U. Puerto Rico), M.A., Ph.D.(Chic.); Finance
O. Toulan; B.Sc.(Georgetown), Ph.D.(M.I.T.); Strategy & Organization
V. Verter; B.A., M.S.(Bogaziçi), Ph.D.(Bilkent); Management Science/Operations Management
Q. Wang; B.S.(Wuhan-China), M.A.(U.S.C.), Ph.D.(Chic.); Finance

Faculty Lecturers
R. Cecere; B.Com, G.D.P.A.(McG.);Accounting
M. Chaudhury; B.A., M.A.(Dhaka), M.A.(Wat.), Ph.D.(S. Fraser); Finance
L. Chauvin; B.A.(Ott.), M.A.(C'dia); Strategy & Organization
R. Donovan; B.Com.(McG.), GDIT(C'dia); Information Systems
L. Goldsman; B.Com.(C'dia), Dip-P.Acc'ting(McG.), C.A.; Accounting
J. Heaphy; B.Com.(C'dia), C.A., F.C.C.A.; Accounting
P. Levy; B.Com.(C'dia), D.P.A., M.B.A.(McG.); Accounting
P. Martucci; B.Com.(C'dia), Dip-P.Acc'ting(McG.); Accounting
I.V. McLachlin; B.Eng.(McG.); Strategy & Organization
M. Mendonça; B.A., B.Com., M.A.(Bombay), M.B.A.(McG.); Organizational Behaviour
N. Moukhaiber; B.E., M.B.A.(American U. of Beruit); Information Systems
S. Sepinwall; B.A.(Sir G. Wms), M.Ed.(McG.); Organizational Behaviour
B. Smith; B.A., M.A.(Dublin) M.Sc.(Albt.), Ph.D.(Queen's); Management Science
V. Vaupshas; B.Sc., M.B.A.(McG.); Marketing
Glenn Zabowski; B.Com., M.B.A.(McG.); Management Science

Adjunct Professor
Peter Johnson; B.A.(Sir G.Wms.), C.M.C.; Entrepreneurial Studies

45.2 Programs Offered

McGill University offers eleven programs which provide graduate level education in management. All programs have been tailored to meet the special needs and demands of different groups of people. Before embarking on a graduate management education, students should, therefore, be aware of the different and unique features of each program, and select the one which best suits their aspirations and abilities.

1) Master of Business Administration (M.B.A.)
may be taken on either a full-time basis (see section 45.5) or a part-time basis (see section 45.5.3).
2) M.B.A./Law Program
offered in cooperation with the Faculty of Law (see page 213)
3) M.D./M.B.A.
offered in cooperation with the Faculty of Medicine (see page 213)
4) M.B.A./M.Sc.(Agr.Econ.)
offered in cooperation with the Faculty of Agriculture (see page 214)
5) Master of Arts in Economic Policy Management
established with the assistance of the African Capacity Building Foundation and the Economic Development Institute of the World Bank. This program is for experienced policy advisors with superior promise and ability. (see section 45.7.1)

6) Post M.B.A. Graduate Certificate
intended for professional managers who wish to update their skills and/or broaden the base of their education. The certificate may be taken on a full-time or part-time basis. (see section 45.6.1)

7) Ph.D. in Administration
offered jointly by the four Montreal universities: Concordia University, École des Hautes Études Commerciales (affiliated with the Université de Montréal), McGill University, and Université du Québec à Montréal. (see section 45.8)

8) Master of Management in Manufacturing
a 12-month academic program followed by a four-month industrial internship, offered in collaboration with the Faculty of Engineering. (see page 220)

9) Master of Management – International Masters Program in Practising Management (see page 221)

10) Master of Management – McGill/McConnell Program Voluntary Sector (see page 221)

11) Graduate Diploma in Public Accountancy – for more information on this program, please contact Professor Philip Levy at (514) 398-4064.

45.3 Admission Requirements

45.3.1 M.B.A. Program – Admission Requirements

Applicants with strong indications of managerial potential are desired. Given below are the minimum entrance criteria. Owing to the large number of applicants to the McGill M.B.A., merely meeting the minimum requirements will not guarantee acceptance.

a) An undergraduate degree, from an approved college or university, with a Grade Point Average of at least 3.0 out of a possible 4.0, or a B average.

b) A score of at least 550 on the Graduate Management Admission Test (GMAT), written within the past five years.

c) A score of at least 600 on the paper-based Test of English as a Foreign Language (TOEFL) or at least 250 on the computer-based test. TOEFL scores are required of non-Canadian students whose mother tongue is not English and who have not had at least three years of university education in English.

d) At least one year of full-time work experience, following completion of an undergraduate degree.

e) Two letters of reference.

45.3.2 M.B.A. Part-time Studies – Admission

The McGill M.B.A. Program may be also be completed on a part-time basis. This is meant to accommodate persons with full-time employment. Admission as an M.B.A. part-time student may be made twice a year, in September and in January. The admission requirements are shown in section 45.3.1.

Note: Students studying on a part-time basis may transfer to full-time at various stages during their studies. Students wishing to do this must meet with the Student Advisor to review their schedule. (See section 45.5.4.)

45.3.3 M.B.A. Admission – Transfer of Credits

Option 1
Candidates who have completed some portion of the first year of an M.B.A. program at another recognized institution may be granted CREDIT for equivalent courses. In most cases candidates would be admitted to the first year of the program and will complete the remaining first year courses on a part-time basis.

Option 2
Candidates who have completed the entire first year of an M.B.A. program at another recognized institution may be exempt from the entire first year and required to take 15 second-year courses.

In both options, candidates must submit a completed application and meet the competitive entrance requirements of the M.B.A. program.

In order to be awarded an M.B.A. from McGill a minimum of 45 credits must be completed at McGill.

45.3.4 M.B.A. Admission – Advanced Standing

Candidates who hold a Bachelor of Commerce degree from a recognized North American institution with a minimum cumulative grade point average of 3.0 on a four (4) point scale and possess three or more consecutive years of full time work experience following completion of their undergraduate degree in a position that has allowed for interaction across a number of areas in the enterprise may be considered for advanced standing. Candidates will be required to take 15 second-year M.B.A. courses (45 credits). Applicants applying for advanced standing must complete and return the advanced standing application, accompanied by a document detailing management responsibilities and the M.B.A. application form.

Note: Students accepted with Advanced Standing may apply for the International Exchange Program. However, the term of study spent abroad will be IN ADDITION to the 45 credits required for their M.B.A.

45.3.5 Special Student Admission

Special students are those students who are not working toward a McGill M.B.A. or a Post M.B.A. Graduate Certificate. They already have their M.B.A. degree.

Students must submit an application form and $100 fee, plus official M.B.A. transcripts. The deadlines for submission of applications are the same as admission deadlines.

45.3.6 Visiting Student Admission

Visiting students are graduate students from another university taking a course in the Faculty of Management for credit at their home university.

Quebec students must complete the inter-university transfer form and present it at registration. Visiting students from outside the province of Quebec must forward an application form and $100 fee, as well as a letter of permission from their school indicating the course(s) they are permitted to follow.The letter must also confirm that they are in good standing at their home university.

The deadlines for submission of applications are the same as admission deadlines.

45.4 Application Procedures

45.4.1 M.B.A. Application Procedure

The McGill M.B.A. program begins in September of each year. Deadlines for receipt of application, $100 fee and all supporting documents are:

- April 1 for International Applications
- May 15 for Domestic Applications

Applications are reviewed on a rolling basis so that the earlier a file is complete, the sooner the applicant may expect to receive an answer. The undergraduate record, GMAT and TOEFL scores (where applicable), work experience and letters of reference are the criteria used in making admission decisions. With the exception of a few select cases, a personal interview is not mandatory.

Application forms may be obtained from, and documents are to be submitted directly to:

Admissions Office
McGill M.B.A. Program
Faculty of Management
McGill University
1001 Sherbrooke Street West
Montreal, Quebec H3A 1G5
Email: mba@management.mcgill.ca
Website: http://www.management.mcgill.ca

Applicants must submit, or arrange for the submission of:

1) the first three copies of the completed Application Form;
2) a completed Personal Background Sheet;
3) duplicate official transcripts of undergraduate marks (and graduate, if any) forwarded directly by the applicant's university. For international applicants, the academic records must include: transcripts in the original language with official translations (into English), listing courses and grades for each year of study, verifying conferral of degree. These documents must bear the actual signature of the registrar and the official seal or stamp of the institution.
3) the $100 application fee (see section 45.4.3 for further information);
4) two letters of reference forwarded from individuals who have been directly responsible for evaluating the applicant's academic and/or managerial performance and potential.

d) the GMAT score (written within the past five years) and the TOEFL score (where applicable) forwarded directly from the Educational Testing Service. (See section 45.4.4 for further information.)

Please note that entrance to the McGill M.B.A. is highly competitive. It is in the applicant's interest to apply as early as possible. Applicants will be notified when their file is complete and a decision will follow within 4 weeks.

No documents submitted as part of the application package will be returned to the applicant.

45.4.2 M.B.A. Part-Time Application Procedures

Admission as an M.B.A. part-time student may be made twice a year. Deadlines for receipt of application, $100 fee and all supporting documents are:

- May 15 for September
- November 1 for January

The application procedure is the same as that for full-time studies. Please refer to section 45.4.1.

45.4.3 Application Fee Information

The $100 application fee must be paid using one of the following methods:

- Certified Personal cheque in Canadian dollars drawn on a Canadian Bank.
- Certified Personal cheque in U.S. dollars drawn on a U.S. Bank.
- Canadian Money Order in Canadian dollars.
- Money Order in U.S. dollar.
- Bank draft in Canadian dollars drawn on a Canadian Bank.
- Bank draft in U.S. dollars drawn on a U.S. Bank.

In all cases the cheque/money order should be made payable to McGill University.

Please note that a file will not be opened until an official application with the $100 fee is received.

45.4.4 GMAT and TOEFL Information

Graduate Management Admission Test (GMAT)

The GMAT is administered by the Educational Testing Service (ETS). It is required of all M.B.A. applicants. The McGill ETS Code Number is 0935. Only the GMAT written within the last five years will be considered valid. GMAT test results must be sent to McGill directly from the ETS; photocopies will not be accepted.

All inquiries concerning testing arrangements should be addressed to: Graduate Management Admission Test, Educational Testing Service, P.O. Box 6103, Princeton, N.J. 08541-6103 U.S.A. Telephone: (609) 771-7330

In October 1997, the Graduate Management Admission Council (GMAC) launched a computer-adaptive GMAT which replaced the paper-and-pencil test in North America, Europe, Asia and Latin America. Administration of the paper-and-pencil GMAT will be offered in all other international locations until the network of testing sites is complete.

There is a learning book available to the students entitled "GMAT". This book may be obtained from many bookstores, including the McGill University Bookstore, located at 3420 McTavish Street and students may wish to buy this book prior to writing the GMAT examination.

Test of English as a Foreign Language (TOEFL)

The purpose of this test is to determine the English proficiency of non-Canadian individuals whose native language is not English.

For a copy of the Bulletin of Information, write directly to the Educational Testing Service, Box 6152, Princeton, New Jersey, USA 08541-6151. Copies can also be obtained from the Admissions, Recruitment and Registrar's Office in the James Administration Building.

45.4.5 Application Procedures for other Programs

Application procedures for the other programs listed under section 1.2 may be found in each individual program's section:

M.B.A./Law, see Page 213.

M.D./M.B.A., **see Page 213.**

M.B.A./M.Sc.(Agr.Econ.), see Page 214.

Master of Arts in Economic Policy Management, see Page 220.

Master of Management in Manufacturing, see Page 220.

Post M.B.A. Graduate Certificate, see Page 220.

Ph.D. in Administration, see Page 221.

International Masters Programs in Practising Management (IMPM), see Page 221.

Master of Management – McGill/McConnell Program Voluntary Sector, see Page 221.

45.4.6 Procedure for Accepting an Offer of Admission to the M.B.A. Program

Those students admitted to the first year of the M.B.A. Program should forward a registration deposit fee of $500 (Canadian or U.S. funds; certified cheque or money order) payable to McGill University. Two passport size photographs must also be supplied along with the deposit fee.

a) This fee is payable immediately upon receipt of the letter of acceptance and a place is reserved.
b) If this fee is not paid by the date specified in the letter of acceptance, no reservation will be made.
c) The fee is applied against tuition fees provided that the candidate informs the Faculty of Management by the specified date that they will be joining the program and if they register by the given date of registration.
d) The $500 fee is refundable provided the candidate informs the Faculty by the specified date that they do not intend to join the program for the coming academic year.
e) The $500 fee is forfeited if the candidate fails to inform the Faculty by the specified date that they will not be attending the program.
f) Students who are unable to begin attending classes in the first week of the first trimester will be required to defer their admission until the next admission period.

Note: International Students should carefully follow all instructions sent to them re applying for their Certificate of acceptance (CAQ) which is required of all students who wish to study in the Province of Quebec (see page 211). The M.B.A. Office is unable to help students obtain this document.

All of the above is clearly outlined in the letter of acceptance.

45.4.7 Registration

All accepted candidates will receive a package outlining registration procedures as well as deadline dates for fee payment.

Candidates who fail to register during the specified registration period may do so later but will be charged a late registration fee by the University.

45.4.8 Orientation

Orientation for all new M.B.A. I students is held during the week before classes begin. **This activity is a mandatory part of M.B.A. I.** During this orientation, students get acquainted with other students and may form initial study groups. There is also an opportunity to meet with professors and to have various facets of the program outlined and clarified. An orientation fee of approximately $80 is assessed to each student.

45.4.9 International Applicants

The University is unable to waive or defer the application fee for international students. Applications received without the application fee will not be processed.

There is no financial aid to bring international students to study in Canada. If an international applicant has been selected to receive an award, the financial aid is awarded only after registration in September. International applicants must, therefore, rely on their own financial resources to enter Canada.

The regulations governing international students working in Canada should be checked with the nearest Canadian Embassy or Consulate. Visas must be checked also.

"Certificat d'acceptation" (C.A.Q.)/ (Certificate of Acceptance)

Any person, other than a Canadian citizen or Permanent Resident wishing to pursue studies in Quebec, must be in possession of a "Certificat d'acceptation" (Certificate of Acceptance) issued by the Ministry of Immigration of Quebec. This certificate is needed to obtain a student authorization (issued by Canada Immigration). In order to obtain the "Certificat d'acceptation" (C.A.Q.) the student must submit an application to a Quebec Immigration Representative.

Details on Quebec Immigration offices and application procedures are routinely sent with official letters of admission.

Note: International Students should carefully follow all instructions sent to them when applying for their Certificate of Acceptance (CAQ) which is required of all students who wish to study in the Province of Quebec. The MBA Office is unable to help students obtain this document.

45.5 M.B.A. Program Requirements

Students studying on a full-time basis must complete this 60-credit program in three years; part-time students have a five-year time limit.

The first year of the program is designed to provide students with the basic managerial techniques and skills. The second year allows the student to concentrate in a particular field. Students will take both day and evening classes from September to April for two years.

First Year (M.B.A. I)

Students must have a thorough understanding of Word, Excel and basic management statistics prior to entry.

Three highly integrative **9-Week Modules** have been developed to provide the skills essential to the entire organization. Emphasis is on team work and team building. The Integrative Core is a year-long project course which integrates material across the three modules.

The first year will run on a Trimester basis.

First Trimester	Module I	September to November
Second Trimester	Module II	November to February
Third Trimester	Module III	February to April

MODULE I	**(September to November)**	**Credit Weight**
280-611	Financial Accounting	2
280-612	Organizational Behaviour	2
280-613	Managerial Economics	2
280-614	Management Statistics	2
280-628	Integrative Core	2
Module II	**(November to February)**	
280-615	Finance (Non Finance Stream) **or**	2
280-641	Elements of Modern Finance I	2
280-616	Marketing	2
280-617	Operations Management	2
280-618	Human Resource Management	1
280-619	Research, Development and Engineering	1
280-628	Integrative Core (continues)	2
Module III	**(February to April)**	
280-620	Information Systems	2
280-621	International Environment	2
280-622	Organizational Strategy	2
280-640	Management Accounting **or**	2
280-642	Elements of Modern Finance II	2
280-628	Integrative Core (concludes)	2

The Integrative Core runs from September to April. Students completing the M.B.A. part-time will register for the Integrative Core while in the process of completing the last M.B.A. I courses.

Courses with a credit weight of 2 run for 9 weeks with 1 week for exams. Courses with a credit weight of 1 (Module II) have 4½ weeks of class each.

Second Year (M.B.A. II)

The second year of the M.B.A. allows students to focus on a particular area of interest and to develop some specialization; or to create their own general management curriculum. Courses are offered both during the day and the evening. Students choose one of the following options to earn the 30 credits:

1) Six courses (18 credits) from the concentration in which the student wishes to specialize, and four electives (12 credits). It is not necessary to select the area of concentration until completion of the first year.

   A Research Paper is an optional part of the M.B.A. which may be included as part of a concentration or replace free electives. The research paper is worth 6 credits.The Research Paper is designed to familiarize students with the process and the problems of independent research. The student is given considerable freedom in choosing research topics. Students have the opportunity to work on a one-to-one basis with a Faculty Member.

or,

2) Ten courses (30 credits) selected as part of a General Management program.

45.5.1 M.B.A. II Year Concentrations

The M.B.A. II Concentrations are very much geared to the needs and demands of the employment market. They have been designed with considerable thought and attention to provide meaningful and useful packages of courses which will be an advantage upon graduation.

M.B.A. students may select a concentration or create their own General Management Curriculum.

A Concentration consists of six courses within an area.

Concentrations include:

Entrepreneurial Studies
Finance
International Business
Management for Development
Marketing
Operations Management
Strategic Management

Support courses from accounting, human resource management, industrial relations, management information systems, management science, and managerial economics are also offered to supplement the six courses within each concentration.

45.5.2 Descriptions of Concentrations

ENTREPRENEURIAL STUDIES CONCENTRATION

Required Courses (9 credits)

274-652 (3) Managerial Finance
270-664 (3) Creating the Small Business
270-635 (3) Business Law

Complementary Courses (9 credits)
three courses selected from the following:

271-614 (3) Taxation Seminar
275-652 (3) Marketing Management II
270-629 (3) Service Industries
270-665 (3) Managing Small Business Enterprise

FINANCE CONCENTRATION

Complementary Courses (18 credits)
six courses selected from the following:

274-541 (3) Applied Investments
274-639 (3) Options & Finance
274-644 (3) Canadian Financial Institutions
274-645 (3) Money and Capital Markets
274-646 (3) Investments and Portfolio Management
274-647 (3) Advanced Finance Seminar
274-648 (3) Corporate Finance
274-690 (3) Topics in Finance
274-693 (3) International Finance I
274-694 (3) International Finance II
274-660 (3) Global Investment Management

INTERNATIONAL BUSINESS CONCENTRATION

Complementary Courses (18 credits)
six courses selected from the following:

270-615 (3) Global Economic Competitiveness
270-625 (3) Asia/Pacific Management (formerly 278-670)
270-626 (3) International Business Law (formerly 278-674)
270-627 (3) North America in the Global Market (formerly 278-675)
270-690 (3) Topics (formerly 278-690)
270-697 (3) European Economy and Management (formerly 278-697)
272-628 (3) Women as Global Leaders and Managers
272-685 (3) Cross-Cultural Management
274-660 (3) Global Investment Management (formerly 278-660)
274-676 (3) International Financial Management (formerly 278-676)
274-693 (3) International Finance I (formerly 278-693)
274-694 (3) International Finance II (formerly 278-694)
275-630 (3) Marketing in Developing Countries
275-698 (3) International Marketing Management (formerly 278-698)
276-651 (3) Strategic Management in Development Countries
276-669 (3) Managing Globalization
276-683 (3) International Business Policy (formerly 278-683)

MANAGEMENT FOR DEVELOPMENT CONCENTRATION

Required Courses (12 credits)

275-630 (3) Marketing in Developing Countries
276-651 (3) Strategic Management in Developing Countries
278-685 (3) Cross-Cultural Management
276-640 (3) Strategies for Sustainable Development

Complementary Courses (6 credits)
two courses chosen from the following departments, with a maximum of one from the Faculty of Management:

Anthropology
Economics
Geography
Management
Political Science
Sociology

Other electives, with the approval of the Area Coordinator.

Students must have permission from the instructor to enrol in graduate-level courses outside the Faculty of Management and meet prerequisites for such courses. Other faculties are not required to offer the courses on a regular basis.

MARKETING CONCENTRATION

Required Courses (6 credits)

275-652 (3) Marketing Management II
275-658 (3) Marketing Research I

Complementary Courses (12 credits)
four courses selected from the following:

275-654 (3) Marketing Communications
275-655 (3) Marketing Planning
275-657 (3) Consumer Behaviour
275-659 (3) Industrial Marketing
275-630 (3) Marketing in Developing Countries
275-690 (3) Topics in Marketing
275-698 (3) International Marketing Management

OPERATIONS MANAGEMENT CONCENTRATION

Complementary Courses (18 credits)
six courses choosen from the following:

277-601 (3) Management of Technology in Manufacturing
277-602 (3) Manufacturing Strategies
277-603 (3) Logistics Management
277-605 (3) Total Quality Management
277-608 (3) Data Decisions and Models
277-631 (3) Analysis of Manufacturing Systems
277-671 (3) Statistics for Business Decisions
277-675 (3) Applied Time Series Analysis
277-676 (3) Applied Multivariate Data Analysis
277-678 (3) Simulation of Management Systems
277-679 (3) Applied Optimization I
277-690 (3) Independent Topics in Operations Management
280-610 (6) Research Paper in Operations Management

STRATEGIC MANAGEMENT CONCENTRATION

Complementary Courses (18 credits)
one course chosen from the following:

276-630 (3) Managing Strategy
276-637 (3) Cases in Competitive Strategy
276-680 (3) Strategy, Commitment & Choice

and five courses chosen from the following

276-562 (3) Seminar in Organizational Strategy
276-638 (3) Managing Organizational Politics
276-639 (3) Managing Corporate Diversification
276-640 (3) Strategies for Sustainable Development
276-650 (3) Managing Innovation
276-651 (3) Strategic Management in Developing Countries
276-652 (3) Ethics in Management
276-669 (3) Managing Globalization
276-690 (3) Topics Strategic Management

GENERAL MANAGEMENT STREAM

Students may also choose to design their own packages of courses in the M.B.A. II program.

DOUBLE CONCENTRATIONS

Students wishing to do a Double Concentration (one which is not outlined above) must take five courses in each area. These courses will be designated by the Area Co-ordinators involved but will probably include the mandatory courses. No more than two Concentrations will be awarded.

45.5.3 M.B.A. Part-Time Studies

The course requirements for students completing their degree on a part-time basis are identical to those studying full-time. Please

refer to page 211 for a description of the first year Modules (M.B.A. I), and to page 211 for the Second Year (M.B.A. II).

The usual course load for a student studying part-time is two courses per Trimester. This would permit students to complete the first year course requirements in 2½ to 3 years. However, this is simply a guide and students may elect to take the number of courses which best suits their schedule. In the second year (M.B.A. II) courses are given in the more traditional semester schedule i.e. September to December and January to April. Students may also take second year courses in the summer terms provided they have the necessary prerequisites.

A limit of 5 years is permitted to complete the degree requirements.

45.5.4 Combined Full-time and Part-time Studies

There are two options by which students may combine full-time and part-time studies.

Option 1
Upon completion of the entire first year (M.B.A. I) on a part-time basis, students may request a status change to full-time to complete the second year (M.B.A. II) as full-time students.

Option 2
Upon completion of some portion of the first year (M.B.A. I) on a part-time basis, students may request a status change to full-time to complete the degree requirements. This may require some complex scheduling of courses and will require a meeting with the Student Advisor to make the necessary program arrangements.

Students wishing to change their status to full-time must make a written request at least 6 weeks prior to the beginning of the relevant term. These requests should be sent to the Student Advisor. It should also be noted that acceptance to any one of these options is not automatic. In all cases the student's record in the completed courses as well as availability of space in the Program will be considered.

45.5.5 Additional M.B.A. Programs

The following special programs are also available: the M.B.A. International Exchange program; M.B.A. *Stage* program; M.D./M.B.A. program; M.B.A./Japan; M.B.A./Law program; M.Sc./M.B.A. program in Agricultural Economics.

M.BA. INTERNATIONAL EXCHANGE PROGRAM

Through the McGill M.B.A. Exchange Program there are exciting opportunities to study abroad.

Participation in the program gives McGill students the opportunity to spend part of the second year of the M.B.A. studying at a business school abroad. Students successfully completing the program's requirements receive both the Master's Degree from their home university and an International Management Certificate from the foreign institution which they attended. McGill is part of the Program in International Management (PIM), a consortium of the leading business schools in North America, South America, Europe, and Asia. There are exchanges with both PIM and non-PIM schools.

The following schools may exchange students with McGill in 1999-2000:

PIM members:
– Asian Institute of Management, Manila, Philippines
– Copenhagen Business School, Denmark
– Erasmus University, Rotterdam, The Netherlands
– ESADE (Escuela Superior de Administracion y Direcion de Empresas), Barcelona, Spain
– Fundacao Getulio Vargas, Sao Paulo, Brazil
– HEC (Hautes Études Commerciales), Jouy-en-Josas, France
– ITAM, Mexico
– Luigi Bocconi, Milan, Italy
– Norwegian School of Economics
– Stockholm School of Economics, Sweden
– University of Cologne, West Germany
– University of Louvain, Louvain-La-Neuve, Belgium

Non-PIM members:
– Bilkent University, Turkey
– Bogazici University, Turkey
– ISA (Institute Supérieur des Affaires), Jouy-en-Josas, France
– ITESM, Monterray, Mexico
– Korea University, Korea
– Manchester Business School, England
– Solvay Business School, Brussels, Belgium
– Thammasat University, Bangkok, Thailand
– University of Texas at Austin, U.S.A.

M.B.A. *STAGE* PROGRAM

The M.B.A. *Stage* program has been designed to provide students the opportunity to integrate their studies in a practical work situation. This Program will be most appealing for students with little work experience in their field of specialization. The work experience is an essential part of the *Stage* Program and students who opt for this will be required to:

1. Secure an offer from a prospective employer – the offer must be made in writing and should include the job/*Stage* description, duration and remuneration.
2. Obtain approval for this *Stage* by the M.B.A. Director.
3. Upon completion of the *Stage* and in order to obtain credit, submit a paper on the integration of the applied and academic aspects of the first year courses and the *Stage* experience

Note: International students will also require a work-authorization for employment from Citizenship and Immigration Canada.

M.D./M.B.A. PROGRAM

The M.D./M.B.A. program recognizes that physicians will be increasingly involved in the growing partnership between Business and Health/Sickness care into the next century. The program will graduate a group of doctors with skills uniquely directed towards management in the Health Care Sector. This will provide opportunity to compete for positions in a growing niche of physician-managers who will be found in all facilities from the smallest clinic to the largest tertiary health care facility, from research laboratory to university or hospital medical departments.

This is a five-year program in which the first year from September to the following July is spent in the Faculty of Management. In August the students will begin their medical studies with the first year class and elements of health management and practicums will be integrated into the elective opportunities in the regular four-year medical curriculum. At Graduation, graduates will receive an M.B.A. from the Faculty of Management and an M.D.,C.M. from the Faculty of Medicine.

Applicants to this program must apply separately to each program and meet the admission requirements of both the Faculty of Medicine and the Faculty of Management. Applications and all supporting documents for both M.B.A. and Medicine must be received by the respective Admissions Offices by **November 15**.

Further information and application forms for the Faculty of Medicine can be obtained from Program Administrator M.D./M.B.A. Program, McIntyre Medical Sciences Building, 3655 Drummond Street, Montreal, QC, H3G 1Y6.
Telephone: (514) 398-3521 Fax: (514) 398-3595

M.B.A./JAPAN

This two-year M.B.A. program – delivered by McGill faculty at the campus of the prestigious Sophia University in downtown Tokyo, Japan – provides local students with a world-class North American style graduate business education in International Business. For more information visit our Website at http://www.Management.mcgill.ca (Programs).

M.B.A./LAW PROGRAM

The Faculty of Management, in cooperation with the Faculty of Law, offers a joint M.B.A./Law degree. This program prepares students for admission to the Quebec legal profession as well as for admission to the Bars of the Common Law Provinces.

The combined degree program has been designed for those students who are interested in both the legal and administrative aspects of business and will help prepare them for careers in private and public enterprises as well as government service. The joint program may be completed in 4½ years.

Students who are interested in applying for the joint program must apply to both the Faculty of Law and the Faculty of Management. They must meet the admission requirements for both Faculties. For Law, students must demonstrate a substantial fluency in both the French and English languages. If accepted, students will begin their first year in the M.B.A. program with a guarantee of admission to Law the following year, providing they successfully complete the first year M.B.A. program requirements.

Students wishing information on the Law program should contact the Faculty of Law, Admissions Office, 3674 Peel Street, Montreal, Quebec, H3A 1W9. Telephone: (514) 398-40505.

M.SC./M.B.A. PROGRAM IN AGRICULTURAL ECONOMICS

The M.Sc./M.B.A. Program in Agricultural Economics is a joint program offered at McGill University by the Faculty of Agricultural and Environmental Sciences and the Faculty of Management. Students who complete all the degree requirements will be awarded two degrees, an M.Sc. and an M.B.A. and would acquire expertise in the Agribusiness, Environment or Natural Resource Economics areas. Currently, no such joint degree program exists in Canada and few exist in other countries.

Due to pressures of globalization, industries are being faced with challenges that are themselves becoming more complex. Many of these are the result of within-country and cross-border jurisdictional concerns, such as the environment. The skills required for business management in these situations are provided by the M.B.A. training of the joint degree program. The thesis component and the additional analytical courses of this joint degree will allow and challenge the student to address pertinent issues in greater detail.

M.Sc. Component

The Master of Science (M.Sc.) Degree in Agricultural Economics is designed to provide students with an understanding of economic theory and the ability to apply these theories to research. A thesis is a requirement for graduation. The Agricultural Economics component of this joint degree will require a total of 45 credits: 19 credits of course work and 26 credits of thesis work including the Thesis Internships.

M.B.A. Component

The Master of Business Administration is a general degree program which provides students with basic managerial skills and a professional concentration in a particular field. Basic managerial techniques and skills are developed with a required core of courses comprising three modules and 30 credits. A further 15 credits are taken to fulfil the basic requirements (45 credits) of the M.B.A. portion of the program. Students may start the program in either degree component, but it is expected that most students will start in the M.B.A. component. The second year of the joint program provides the "bridge" between the two subject fields. The first M.Sc. Internship, combined with the Integrative Core courses will provide the opportunity for the program "mix" to occur along with the thesis topic to be developed. Students can individualize their programs to suit their thesis research topic.

Admission

Students must fulfil the admission requirements for both the M.Sc. degree in Agricultural Economics and the M.B.A. degree in the Faculty of Management. Admission to the M.Sc. in Agricultural Economics requires a high academic standing in a Bachelor of Science degree in Agricultural Economics or a closely related area with a strong background in economic theory and mathematics (please consult the Department of Agricultural Economics). The admission in M.B.A. is competitive. Please refer to section 45.3.1 for the admission requirements.

Students are eligible for a number of scholarships. The Department of Agricultural Economics offers the Sir Vincent Merideth Fellowships to a limited number of outstanding students. Bilateral fee agreements exist with several nations to obtain International Fee Waiver.

Further Information

For more information and application forms please contact the:

Chairman, Graduate Studies
Department of Agricultural Economics
McGill University, Macdonald Campus
Ste. Anne de Bellevue, Quebec, Canada H9X 3V9
Telephone: (514) 398-7820 Fax: (514) 398-8130;
Email: atkinson@agradm.lan.mcgill.ca
http://www.agrenv.mcgill.ca

45.5.6 Policies and Regulations of the M.B.A. (Full-Time)

The following is a brief overview of the rules and regulations of the M.B.A. program. Students should request a copy of the "Official Rules and Regulations" from the M.B.A. office.

The McGill M.B.A. (Full-Time) is designed as a two-year program. The academic year begins in September and ends in May. Students admitted with advanced standing may complete the program in 15 months.

Withdrawal from an M.B.A. Course

a) Course withdrawals in the first year of the M.B.A. Program are not normally permitted and will be counted as a failure. Exceptions may be granted with special permission but only in the case of exceptional circumstances; this permission must be granted by the M.B.A. Program Director.

b) Students in the second year of the Program may withdraw from a course without penalty provided they do so prior to the deadline date. After the deadline, a J will appear on the student's transcript, and the course will be counted as a failure. Exact deadline dates will be provided by the beginning of each term.

Withdrawal from the M.B.A. Program

Students wishing to withdraw from the McGill M.B.A. program must complete a "Withdrawal Form" available from the M.B.A. office. Students will not be considered as officially withdrawn until this form is completed. Students who drop out of the program but do not complete this form will be billed for the full tuition. Refer to the General Information and Faculty Regulation Section of the Graduate Studies Calendar for further information.

Exemptions

M.B.A. I students may be exempted up to a maximum of 15 credits excluding the integrative core, based on academic proof and contingent on professors' and M.B.A. Program approval. Each credit must be replaced by a second year credit.

Course Deferrals

Deferral of courses in the M.B.A. Program is normally not permitted. All students registered in the Program full-time are expected to carry a full course load each term. Only in very exceptional circumstances will a student be permitted to defer a course. Written justification must be provided and submitted to the M.B.A. Program Manager for approval.

Grading and Promotion Standards

The pass mark for each course is 65%.

Failures

Any student failing two courses over the duration of the M.B.A. program will be asked to withdraw from the M.B.A. program.

Students who withdraw from courses, excluding "extra" courses, may have the withdrawal counted as a failure for purposes of determining whether they should withdraw from the M.B.A. program.

Students must have obtained at least 55% on the failed course to be eligible to apply for a supplemental examination; students receiving below 55% on the failed course are required to repeat the course or, in the case of an M.B.A. II elective, replace the failure with an additional elective.

Supplementals
Supplemental examinations are in no way considered a right. Rather, they are a privilege to be granted in special circumstances. M.B.A. students are mature and presumed to be capable of passing any of McGill's courses, given proper attention to preparation. Second chances are not a regular feature of the program. Students who have received a failing or unsatisfactory final grade in a course are, therefore, not generally permitted to write supplemental examinations. If a supplemental is permitted, it will substitute for only the final examination in recalculating a final grade. **Students must not approach the Instructors for special permission for supplemental examinations.**

Rereads
In cases where students feel that an error has been made in arriving at their final grade, the Instructor will be requested to carry out a detailed check that all questions have been marked, that class work has been adequately counted toward the final grade and that the final grade has been correctly computed on the basis of term work, final examinations, etc. No fee will be charged for this verification.

For graduate courses (600 and 700 level courses), the application for reassessment or re-read should be sent in writing, together with the original receipt of the reread fee, to the Office of the Associate Vice-Principal (Graduate Studies) within 30 days of the submission of final marks.

Promotion into M.B.A. II
Students must have obtained an overall average, including all failures and supplemental examinations and repeats, of at least 70% to be permitted to continue into second year and in order to graduate.

Outside Elective Courses

An outside elective is any course which is not part of the M.B.A. Program. This includes courses in other faculties within McGill University or outside McGill University

Students wishing to take an elective offered in another department at McGill must first obtain approval from the M.B.A. Program Manager. Once approval is obtained, students must obtain permission from the department offering the course before registering for the elective with their Faculty.

All Quebec Universities have agreed to permit transfer of academic credit and fees among themselves up to a maximum of two half-courses in any one year. However, this agreement includes only those courses not offered at the home university and which fit into the student's program. Authorization for an M.B.A. student to transfer courses must be obtained from the M.B.A. Program Manager and once approval has been granted, the student must complete a Transfer Credit Form, available from the M.B.A. Office.

There are, however, limitations to the number of courses an M.B.A. student can take outside the Faculty of Management during the M.B.A. Program:

a) Students completing a 60-credit program may take 15 credits maximum outside the Faculty of Management. This does not include courses offered by other faculties at McGill and approved as M.B.A. electives in Section 6 of this Calendar.

b) Students may not take courses outside the Faculty if they are offered within the Faculty unless there are exceptional circumstances.

c) Students may not take language courses as credit toward the M.B.A.

45.6 M.B.A. Courses

M.B.A. I YEAR: COURSE DESCRIPTIONS

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

280-611 FINANCIAL ACCOUNTING. (2) The understanding and use of published financial statements as a primary source of accounting information. The concepts, conventions and techniques involved in the preparation of financial statements leading to the analysis and interpretation of this information.

280-612 ORGANIZATIONAL BEHAVIOUR. (2) This course examines many issues that influence the management of people in complex organizations. The term "organizational behaviour" refers to a collection of theory and research that seeks to understand individual and group attitudes, cognitions, and behaviours in organizations. The intellectual traditions of organizational behaviour are rooted in psychology, sociology, economics, anthropology and other disciplines.

280-613 MANAGERIAL ECONOMICS. (2) The course provides an understanding of how economic systems and markets work, a command of how concepts and models developed by economists can be used in managerial decisions, a familiarity with the more practical aspects of competitive behaviour and the structure of competition, and a good appreciation of issues arising in the development of corporate goals and strategies. The emphasis of the course is on the use of economic analysis in strategy formulation.

280-614 MANAGEMENT STATISTICS. (2) The course aims to provide students with the appropriate skills that will allow them to use up-to-date statistical analysis to extract information from a set of data. The emphasis will be placed on the application and interpretation of results rather than on formal statistical theory; the challenge will be in the selection of the appropriate statistical methodology to address the problem and an understanding of the limitations of this answer. The course will fully integrate the use of statistical software with statistical analysis.

280-615 FINANCE. (2) A broad overview of the area of corporate financial management and its relevance to the value-creation process will be examined. One element of value is determined by the costs and benefits of any financial decision evaluated in the capital markets by the various stakeholders of the company. Therefore, the course will focus on the nature of capital markets and its relevance in financial management. It will illustrate alternative methods of valuation and the benefits and limitations of such types of analysis in making financial decisions. Thus, the course will focus on the two broad decisions a manager must make – which projects to invest in and how to finance such projects. Issues such as the impact of ethical considerations, and the interaction between planning and corporate risk management will also be addressed.

280-616 MARKETING. (2) The course concentrates on what may be the most scarce resource for most corporations today – the consumer. The course examines how organizations research what the consumer wants and needs. The course also looks at the social and psychological backgrounds of consumer choice and looks at the methods for grouping consumers into segments according to the heterogeneity of their desires. The firm's response to consumers is then considered. First, the need satisfying item is considered – the product. Following this, the elements of the marketing mix, distribution, pricing and promotion, are considered.

280-617 OPERATIONS MANAGEMENT. (2) A comprehensive introduction to the fundamental decisions and tradeoffs associated with the management of a firm's production activities will be examined. It is a study of how production systems can be effectively designed, utilized and managed in order for them to compete successfully on the basis of different parameters.

280-618 HUMAN RESOURCE MANAGEMENT. (1) This course provides an introduction to critical human resource management issues from the perspective of general managers. The course pre-

sumes that people in any organization represent an important organizational resource, and that effective management of that resource must be a priority. Students are expected to gain: 1) an understanding of the range of human resource problems managers face; 2) an understanding of the considerations which must be taken into account in taking immediate action, as well as developing longer range policies; 3) knowledge of some current and emerging human resource programs and practices, and 4) skills in diagnosing HRM problems and pursuing a course of action to address those problems.

280-619 RESEARCH, DEVELOPMENT AND ENGINEERING. (1) While technology per se exists in many domains of the firm, this course focuses on the research and development domain of the firm. This is an essential function – even in low-tech industries, well managed RD&E is essential because this is what provides the attributes and performance capabilities that customers desire in the products and services sold by the firm. Thus, every manager must understand how RD&E applies knowledge to achieve new performance capabilities, producing new products or services or enhancing existing ones. In addition, managers must be aware of the special and challenging issues faced by managers of this domain. Finally, managers must be aware of how they can provide a more effective link with the RD&E function.

280-620 INFORMATION SYSTEMS. (2) The foundations of the information systems concepts and applications that will be useful to managers in a variety of business specialities will be presented. Thus, the course will allow students to develop a functional information technology literacy in order to understand the impact of information technology on the creation of value in business organizations.

280-621 INTERNATIONAL ENVIRONMENT. (2) The goal of this course is to help students achieve an understanding of the international environment in which Canadian businesses must compete. As Canada has extensive trading and investment relationships with the rest of the world, it is important for managers to be able to analyze the impact of events in the international arena on the domestic economy. Thus, the study is important to managers in all businesses.

280-622 ORGANIZATIONAL STRATEGY. (2) Organizational strategy concerns the process through which managers position their business or unit favorably against competitors, with customers, and in accordance with societal needs. This course emphasizes the skills that managers need to assess strategic threats and opportunities, match them with internal competencies to develop a strategy, devise action plans to realize the strategy, and continually develop capabilities to keep the organization viable.

280-628 INTEGRATIVE CORE. (6) This course provides an integrative perspective to the topics in the first year core, building on progressive stages of integrative understanding from basic management skills looking inward to basic and specialized management skills looking both inward and outward. The emphasis is on pedagogic tools which focus on a holistic view of the organization, forcing an understanding of the management of the enterprise from multiple perspectives and the resolution of conflicting viewpoints.

280-640 MANAGEMENT ACCOUNTING. (2) The use of internally generated accounting information for decision making, planning and control purposes. The concepts and techniques involved in developing and interpreting accounting information that is relevant and useful for managers.

280-641 ELEMENTS OF MODERN FINANCE I. (2) Elements I is the first of the two-course sequence that will take a "tool-kit" approach to modern finance. Elements I will cover the following topics: appropriate evaluation criteria for projects, risk and return; how to construct efficient portfolios; rigorous techniques for valuing financial assets; Corporate financing strategies, efficient market theories and investment banking; principles of debt financing and Modigliani-Miller propositions.

280-642 ELEMENTS OF MODERN FINANCE II. (2) Elements II is the second of the two-course sequence that will take a "tool-kit" approach to modern finance. Elements II will cover the following topics: Asset pricing theories; organization and structure of bond markets; yield curves, term structure of interest rates; boot-strapping techniques, bond pricing; concepts of duration; corporate debt market; structure and covenant features; tax effects, innovations and project finance; derivative markets; futures & forward pricing; options trading strategies.

M.B.A. II COURSE DESCRIPTIONS

- Denotes courses not offered in 1999-2000.

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

270-615 GLOBAL ECONOMIC COMPETITIVENESS. (3) Review of theories and practical case applications on the dynamics of global competitiveness; study of how countries develop and sustain competitive advantage in the rapidly expanding global economy; in-depth analysis by groups of the evolution and status of world competitiveness in selected countries. (Awaiting University Approval)

270-625 ASIA/PACIFIC MANAGEMENT. (3) An in-depth study of business relationships and management practices in the world's most dynamic region. Principal focus is on the dominant Asian economy, Japan, with discussion also of China, Korea and ASEAN countries. Emphasis is placed throughout on underlying cultural differences and how they influence the ways in which organizations are managed. The course is built on a variety of readings, case studies, reports and films in a seminar format emphasizing interaction between students, professor, and invited guest speakers.

270-626 INTERNATIONAL BUSINESS LAW. (3) Introduction to the law regulating international business. The world's three main legal systems and procedure of civil trials before their courts. The main business organizations used in world trade. Forms and documentation of various types of foreign trade contracts. Conflict avoidance, arbitration and international transaction litigation. Specific analysis of trade terms, international commercial transactions (export sales, marketing through distributors, licensing) and international conventions (tax treaties, industrial and intellectual property, GATT, etc.).

270-627 NORTH AMERICA IN THE GLOBAL MARKET. (3) As trade barriers diminish and worldwide communications expand, North America can no longer consider itself an isolated haven of prosperity. But it is still one of the current "triad" of economic powers, centered on the dominating strength of the United States. This course focuses on how the other two North American nations, Canada and Mexico, are adjusting to the realities of global competitiveness and to the often overwhelming regional role of the United States. The evolution of NAFTA and the possible next steps in trade accords are examined, as are continuing efforts to preserve elements of meaningful national autonomy in a rapidly changing global marketplace.

270-630 STAGE PROGRAM. (1) After completing their stage, (minimum 80 hours in an organization) students in the M.B.A program must submit a paper which integrates the applied and academic aspects of the first year courses and stage. This paper involves the equivalent of 15 academic hours.

270-635 BUSINESS LAW. (3) An introduction to law with special emphasis on how it affects business. Topics include: court systems and their organization; practical aspects of procedural law; general nature of contracts and delicts; legal requisites for the validity of contracts; special contracts – sale, lease and hire, agency, bailment, loans, etc.

270-664 CREATING THE SMALL BUSINESS. (3) Focusing on the strategies and operating policies of small business enterprises, the course is designed for individuals who are considering entrepreneurial careers either as owners or managers. Provides a practical

approach to the many problems likely to be encountered in the evolving life cycle of the small business.

270-665 MANAGING THE SMALL BUSINESS ENTERPRISE. (3) The course is designed to teach students the concepts of entrepreneurship and the fundamentals of managing small businesses. It will explore, within the context of small entrepreneurial companies, the various interactions between financing, accounting, marketing, strategic planning, operations and human resources.

270-697 EUROPEAN ECONOMY AND MANAGEMENT. (3) Overview of current social, economic and business developments in Europe; examination of cultures, practices and institutional arrangements underpinning business in both the EU and Eastern Europe; opportunities and challenges in conducting business in Europe.

270-698 HEALTH CARE SYSTEMS. (3) Overview and study of the Quebec, Canadian and international health care systems within the Canadian context. Brief historical overview and analysis of its major elements: Quebec Ministry of Social Affaires, Regional Health Councils, Social Service Centres, hospitals, etc. Critical issues examined: planning health care needs and resources, financing health care, labour relations, patterns of power and assessing quality of care.

- **270-699 HEALTH CARE MANAGEMENT.** (3)
- **271-614 TAXATION FOR MANAGEMENT.** (3)
- **271-616 MANAGEMENT ACCOUNTING: DECISION.** (3)
- **271-617 MANAGEMENT ACCOUNTING: PLANNING AND CONTROL.** (3)

271-618 FINANCIAL REPORTING: STRUCTURE & ANALYSIS. (3) An indepth analysis of corporate financial reporting principles and practices, with emphasis on developing the abilities of the student to discriminate between the form and substance of corporate financial reports. Analysis of all components of the financial statements with the effect of reference to alternative practices on financial reports.

271-619 FINANCIAL REPORTING: VALUATION. (3) Analysis of financial statements and their uses. A financial statement analysis framework will be developed and applied to: (1) development of business and securities valuations, (2) the prediction of bankruptcy, (3) the strategic planning process, (4) the interpretation of consolidated financial statements.

271-690 TOPICS IN ACCOUNTING. (3) A learning cell in which one or more students work with a faculty member.

- **272-521 LEADERSHIP POWER & INFLUENCE.** (3)

272-525 COMPENSATION MANAGEMENT. (3) Total compensation systems in business and service organizations. Understanding various compensation theories and their relation to compensation policies within organizations. Topics include: nature of financial motivation compensation theories, job design and job analysis, compensation practices, designing a compensation package, pay and organizational effectiveness.

- **272-624 HUMAN RESOURCE MANAGEMENT.** (3)

272-625 MANAGING ORGANIZATIONAL CHANGE. (3) Examine strategies of organizational development (OD) that enhance the organization's capacity to respond to change, maximize productivity and allow employees to experience dignity and meaning in their work. Explores the strategic, techno-structural, human process, and human resource management types of OD interventions. In addition, the course will provide opportunities for the practice of various OD skills (process consultation, feedback, observation) which enable managers to identify dysfunctional policies or behaviors. The fundamental theoretical framework of the course will draw upon developments in the behavioural and socio-technical systems approaches to organizational change.

272-628 WOMEN AS GLOBAL LEADERS AND MANAGERS. (3) Women are assuming leadership roles in many fields heretofore almost exclusively led by men. Yet even in the 1990s, less than 5% of international managers are women and less than 3% of international business cases portray women in leadership roles. THis seminar will review the major trends affecting women's power and influence in society in general and in organizations in particular. Participants will develop the vision, skills, and competencies needed for global leadership.

- **272-632 GROUP DYNAMICS & INTERPERSONAL BEHAVIOUR.** (3)

272-633 MANAGERIAL NEGOTIATIONS. (3) Negotiating is a critical managerial skill. The purpose of this course is to allow students to learn to be more effective negotiators. The class environment used to accomplish this goal includes many exercises, personality inventories, and cases. The focus of the course will be on the processes of bargaining and the emphasis is "hands on" learning, although theories of negotiation and research examining negotiation will also be covered. Each student will have a great deal of control over how much he or she will develop into a better negotiator as a result of participating in this course.

- **272-634 CAREER DEVELOPMENT.** (3)

272-685 CROSS-CULTURAL MANAGEMENT. (3) Cross-cultural awareness and communication skills necessary to manage in multicultural organizations. The focus of the course is on the relationship between cultural values and communication styles as they affect inter-and-intra cultural communication of managers, personnel and clients of multinational and multicultural corporations and organizations.

273-605 SYSTEMS ANALYSIS AND MODELLING. (3) Techniques for conducting systems requirements analysis and project management using structured analysis for specifying both manual and automated systems. Focuses on the role of the analyst in investigating the current organizational environment, defining information system requirements, working with technical and non-technical staff, and making recommendations for system improvement. Analysis project.

273-635 TELECOMMUNICATIONS MANAGEMENT. (3) Conceptual foundations of integrated office systems: data, text, voice and video transmission. Issues of network design, and current trends in local area networks. Communications technology and its management. Network protocols and computer interfaces. Applications for distributed computing and office automation will be studied.

273-636 INFORMATION SYSTEMS ADMINISTRATION. (3) This course covers the issues relating to managing information systems resources. A combination of lecture and class discussions covers topics such as the role of the Information Systems department within the corporation, staff organization and leadership, strategic systems, planning, end user computing, and other areas of importance to information systems managers.

273-637 INFORMATION SYSTEMS DESIGN. (3) Principles of business systems designs, organization structure, software design and systems theory. Information system modelling techniques. Inter-organizational systems. Use of Computer Assisted Software Engineering tools. Design Project.

273-638 DATA AND DATABASE MANAGEMENT. (3) Focus on the management of organizational data and database management systems. Practice in database design. Examination of different models of representing data with emphasis on the relational model.

274-541 APPLIED INVESTMENTS. (Prerequisite: Permission of the instructor.) In this course students are exposed to practical aspects of managing investment portfolios. Topics covered include the study of asset mix decisions, stock and bond investments, security analysis, and options and futures contracts. To supplement the educational value of the course, a principal activity of students is participation in the management of a substantial investment fund.

274-639 OPTIONS AND FUTURES. (3) (Prerequisite: 274-646) This course studies the field of investments related to options and futures. The course will concentrate on trading strategies and analytical models for valuing options and futures contacts.

274-644 CANADIAN FINANCIAL INSTITUTIONS. (3) Two interrelated subject areas are explored: the micro-management of financial

institutions using the tools of portfolio and financial intermediation-theory; and the macro, public policy implications of institutions, their forms and legal framework.

274-645 MONEY AND CAPITAL MARKETS. (3) The demand for and supply of money and other financial instruments by and to banks and near banks. Simple analytical models integrating the Canadian institutional aspects. The role of the banking sector in the money creation process is stressed as well as international aspects of monetary policy.

274-646 INVESTMENTS AND PORTFOLIO MANAGEMENT. (3) The prime objective is to provide the student with a rational framework for investment. The portfolio and capital market theory of 274-650 is extended and the empirical evidence supporting these and competing hypotheses is investigated for both individual securities and portfolios.

274-647 ADVANCED FINANCE SEMINAR. (3) (Prerequisites: must have completed at least 4 finance courses and/or be taking last courses in concentration concurrently.) Selected topics will be discussed by Faculty members, invited guest speakers, and the students. Each student is required to select a topic for study and prepare a written report for presentation.

274-648 CORPORATE FINANCE. (3) Concepts and techniques developed in earlier courses are extended and/or applied to problems faced by managers in Corporate Finance. Such problems include: working capital management, capital budgeting, capital structure, dividend policy, cost of capital and mergers and acquisitions. Stresses the application of theory and techniques and extensive use is made of case studies.

274-652 MANAGERIAL FINANCE. (3) (for non-Finance Concentration) Designed as a second course in Finance for students not specializing in Finance. Topics include: short and long term asset and liability management, risk and diversification, and the nature of capital markets. The course format will be a mixture of cases, lectures, projects and discussions.

274-660 GLOBAL INVESTMENT MANAGEMENT. (3) Primary focus will be on global investments. The course will deal with the theoretical foundations of modern international portfolio theory and empirical evidence in a real world setting. It will span the developed markets of Europe and Japan, NICS of the Pacific rim and emerging markets. The primary objective is to prepare a new generation of managers who can operate effectively in the new global investment environment.

274-676 INTERNATIONAL FINANCIAL MANAGEMENT. (3) (For non-Finance concentration) Operational problems and policies of financial management in an international context: the international monetary system; foreign exchange and Eurocurrency markets; determining a firm's exposure to exchange rate changes; protecting against exchange losses; multinational sources and cost of capital; multinational capital project analysis; contemporary developments in international finance. The course has a practical orientation, combining basic conceptual readings with applied case analyses.

274-693 INTERNATIONAL FINANCE I. (3) The international financial environment as it affects the multinational manager. In-depth study of the various balance of payments concepts, adjustment of the external balance, and the international monetary system will be followed by a review of theory and institutional aspects of the foreign exchange and the international (Eurodollar) markets.

274-694 INTERNATIONAL FINANCE II. (3) (Prerequisite: 278-693) Focus on the operational problems of financial management in the multinational enterprise: financing of international trade, determining the firm's exposure to foreign exchange rate changes, protection against exchange losses, international capital budgeting, multinational cost of capital, working capital management and international portfolio diversification.

● **275-557 MARKETING RESEARCH II.** (3) (Prerequisite: 275-658)

275-630 MARKETING IN DEVELOPING COUNTRIES. (3) The focus of this course is on the link between marketing and development. As diverse development philosophies are in practice across the developing world, identifying consistent marketing approaches remains a critical challenge. Issues include prioritizing domestic marketing tasks to suit developmental goals, agricultural, social and product/service marketing, and a discussion of appropriate functional practices. While diverse marketing agents coexist in developing countries, this treatment will place somewhat greater emphasis on domestic marketers and the indigenous exchange processes.

275-640 LAUNCHING NEW VENTURES. (3) This course is a natural complement to the MBA 280-628 Integrative Core, during which students examined the requirements for a new product, service or retail venture. This course will take that plan and develop it into a detailed business plan, just as though the venture would actually be launched. This course has a strong focus on the development of an introductory marketing strategy, organizational structure and financing for new firms – all in the context of launching a new product, service or retail venture.

275-652 MARKETING MANAGEMENT II. (3) Its orientation is one of decision making and problem solving. Focuses on the decision areas of marketing management. Emphasizes the application of marketing theory, concepts and methods to the solution of real life marketing problems.

275-654 MARKETING COMMUNICATIONS. (3) The design and implementation of advertising and promotions. Draws on theories of persuasion to develop a managerially oriented decision making framework. Links the framework to decisions pertaining to creative strategy, media planning, consumer promotions and trade promotions.

275-655 MARKETING PLANNING. (3) The design and implementation of marketing plans. Emphasis on management decision-making; approaches and techniques for formulating marketing objectives; identifying alternate strategies; preparing the marketing plan; implementing and controlling the plan.

275-657 CONSUMER BEHAVIOUR. (3) Research approaches focusing on the behaviour of the consumer in the market place. Intended to sensitize the students to human behaviour in general so they may carry their understanding of basic processes over to the more specific area of the consumer.

275-658 MARKETING RESEARCH I. (3) The basic problems of searching for additional information for better marketing decisions. Designed from the marketing manager's point of view. Placed in a cost-benefit perspective. All steps of the research process (problem definition, data collection methods, sample design, etc.) are covered.

● **275-659 INDUSTRIAL MARKETING.** (3)

275-698 INTERNATIONAL MARKETING MANAGEMENT. (3) Marketing management considerations of a company seeking to extend beyond the confines of its domestic market. A review of product, pricing, channels of distribution and communications policies to develop an optimum strategy (between adapting completely to each local environment and standardizing across them) for arriving at an integrated and profitable operation. Particular attention to international marketing and exporting in the Canadian context.

276-630 MANAGING STRATEGY. (3) This course examines the organizational issues associated with strategic change. It focuses on how managers can orchestrate organizational changes in order to realize strategic intentions and exploit environmental opportunities. Students examine how the strategic change in process works and how to tackle key strategic transitions faced by organizations.

276-637 CASES IN COMPETITIVE STRATEGY. (3) The course applies the techniques for analyzing industries to a number of industries (electronics, photocopy, bicycles, chain saws, securities, fibre optics) through the use of specific company cases. The objective is to develop skills and techniques in a competitive environment and define competitive strategies through practical application.

276-638 MANAGING ORGANIZATIONAL POLITICS. (3) The course examines how organization politics impacts on the individual and

how the individual can impact on the political system. We draw on some of the classic works on power, politics, decision making, and bureaucracy. We then apply the concepts derived from the theory to explicit organizational situations, to develop practical frameworks that will help and benefit the student.

● **276-639 MANAGING CORPORATE DIVERSITIFICATION.** (3)

276-640 STRATEGIES FOR SUSTAINABLE DEVELOPMENT. (3) This course aims to produce new knowledge about the multidimensional nature of sustainable development; develop skills required to formulate and implement policies that integrate economic progress with quality of life and the preservation of the biosphere.

276-650 MANAGING INNOVATION. (3) To survive competitively, many organizations need to develop new products successfully and consistently, yet established firms often face difficulties responding to new opportunities. This course examines the strategic, organizational, and interdepartmental aspects of the new product development process to understand why problems occur and what managers can do about them. Topic areas include (1) the creative synthesis of market possibilities with technological potential; (2) the collaborative coordination of diverse functions in the firm; and (3) the strategic connection between the project and the firm's strategy and structure.

276-651 STRATEGIC MANAGEMENT IN DEVELOPING COUNTRIES. (3) The course examines strategic management challenges in developing countries using lectures and discussion of readings and cases. Topics include economic policy management (national development strategies, structural adjustment, privatization), economic cost/benefit analysis, technology choice and transfer, negotiations between multinational firms and host governments, and strategic management for public enterprise, family-owned firms, economic groups, and developmental organizations.

276-652 ETHICS IN MANAGEMENT. (3) An examination of the economic legal and ethical responsibilities of managers in both private and public organizations. Through readings, case studies, discussions and projects, the class evaluates alternative ethical systems and norms of behaviour and draws conclusions as to the right, proper and first decisions and actions in the face of moral dilemmas. The focus of this course is on the decision processes, values and consistency of values of the individual and on the impact of systems control and incentives on managerial morality.

276-669 MANAGING GLOBALIZATION. (3) MBAs need to understand international competitive issues, such as: forces for industry globalization, a firm's international expansion process, and international competitive strategies. Many types of firms will be analyzed, from small U.S. and Canadian firms beginning to explore internationally to large multinationals that are managing investments around the world.

276-680 STRATEGY, COMMITMENT AND CHOICE. (3) To create a competitive advantage, a company must commit itself to developing a set of capabilities superior to its competitors. But such commitments tend to be costly and hard to reverse. The course addresses the broad issues of how a company decides to commit to a strategy and how competition and uncertainty are to be considered in that choice.

276-683 INTERNATIONAL BUSINESS POLICY. (3) Development and application of conceptual approaches to general management policy and strategy formulation in multinational enterprises. Alternative forms of international business involvement (licenses, contractual arrangements, turnkey projects, joint ventures, full direct investment); formulation and implementation of international, multinational and transnational competitive strategies; technology transfer; ownership strategy; international collaborative arrangements. A combination of conceptual readings and applied case analyses.

● **277-600 APPLICATIONS IN PRODUCTION MANAGEMENT.** (3) (Prerequisite: 277-635 or permission of instructor.)

277-601 MANAGEMENT OF TECHNOLOGY IN MANUFACTURING. (3) This course discusses the latest developments in manufacturing technology and manufacturing planning, and examines issues in manufacturing management. Lectures and cases emphasize both the understanding of technology as well as operational and planning issues in effective utilization of technology. With this as a framework the course deals with appropriate technology (conventional and automated) and its evaluation, development and implementation process, manufacturing planning and design, design for manufacturability and the engineering/manufacturing interface. The course will present in detail operational issues related to management (design and control) of automated systems.

● **277-602 MANUFACTURING STRATEGIES.** (3)

277-603 LOGISTICS MANAGEMENT. (3) Concerning the internal logistics, the design and operation of a production-distribution system will be discussed. Emphasis will be given to the management of supply chains in global manufacturing companies. The external logistics part will include an analysis of the prevailing sourcing strategies and alternative means of customer satisfaction.

● **277-605 TOTAL QUALITY MANAGEMENT.** (3)

277-608 DATA, DECISIONS AND MODELS. (3) The goal is to evaluate quantitative information and to make sound decisions in complex situations. The course provides a foundation for various models of uncertainty, techniques for interpreting data and many decision making approaches in both deterministic and stochastic environments. (Awaiting University Approval)

● **277-630 PRODUCTION FOR COMPETITIVE ADVANTAGE.** (3)

277-631 ANALYSIS OF MANUFACTURING SYSTEMS. (3) This course presents a framework for design and control of modern production and inventory systems, and bridges the gap between theory and practice of production and inventory management. The course develops analytical concepts in the area and highlights their applications in manufacturing industry. The course is divided into three segments. The first segment looks at the production planning process and discusses in detail the resource allocation issues. The second segment deals with analysis and operation of inventory systems. The third segment integrates production planning and inventory control and looks at various integrated models for determining replenishment quantities and production lots.

● **277-632 SAMPLE SURVEY METHODS AND ANALYSIS.** (3)

● **277-633 APPLIED DECISION ANALYSIS.** (3)

277-671 STATISTICS FOR BUSINESS DECISIONS. (3) Theory, methods of linear statistical models, application to management. Simple, multiple, polynomial regression; matrix approach to regression; diagnostics and remedial measures; indicator variables; model selection, including stepwise regression; autocorrelation, one-and two-factor ANOVA, analysis of convariance; selected topics in experimental design.

277-675 APPLIED TIME SERIES ANALYSIS FOR MANAGERIAL FORECASTING. (3) Management applications of time series analysis. Starting with ratio-to-moving-average methods, the course deals successively with Census 2, exponential smoothing methods, the methodology introduced by Box and Jenkins, spectral analysis and time-series regression techniques. Computational aspects and applications of the methodology are emphasized.

277-676 APPLIED MULTIVARIATE DATA ANALYSIS. (3) Statistical methods for multivariate data analysis, including multivariate analysis of variance (MANOVA), multivariate linear regression, principal components, factor analysis, canonical correlation, discriminant analysis, classification procedures, and clustering methods. The course emphasizes management applications and makes extensive use of statistical software packages, including SAS and SYSTAT.

277-678 SIMULATION OF MANAGEMENT SYSTEMS. (3) Building simulation models of management systems. The construction of useful models, the design of simulation experiments and the analysis and implementation of results. Students are expected to design a complete simulation of a real problem using a standard simulation language.

277-679 APPLIED OPTIMIZATION I. (3) Methodological topics include linear, nonlinear and integer programming. Emphasis on modelling discrete or continuous decision problems that arise in business or industry, using the modern software tools of algebraic modelling (GAMS) that let the user concentrate on the model and on its implementation rather than on solution techniques. Management cases involving energy systems, production and inventory scheduling, logistics and portfolio selection, will be used extensively.

- **277-680 APPLIED OPTIMIZATION II.** (3) (Prerequisites: 277-679 or equivalent, and a working knowledge of a computer language Fortran, Pascal, Basic...)

279-603 INTRODUCTION TO INDUSTRIAL RELATIONS. (3) The goal of this course is to develop student's understanding of law, institutions, current practices, and power relations affecting the workplace. Topics include: regulation of employment, relationships in the unionized and nonunionized sectors, managerial approaches to labour relations, collective bargaining, union organizing, negotiation of collective agreements, dispute resolution and grievance procedures.

- **279-604 COLLECTIVE BARGAINING IN THEORY AND PRACTICE.** (3)
- **279-605 THE ROLE OF GOVERNMENT IN LABOUR RELATIONS.** (3)

279-633 CREATING WEALTH & PROSPERITY. (3) The objective of the course is to show the similarities and differences between the ways governments can create prosperity, and the ways companies can create wealth. The first part of the course covers topics in economic policy (what makes some countries, regions prosper and others fall behind), the second part overs financial, managerial and strategic topics companies face (what makes their market value increase and what makes this value diminish).

280-610 RESEARCH PROJECT. (6) The process and problems of independent research. Choice of topic may be a normative or descriptive study based on primary or secondary data. Opportunity to work on a one-to-one basis with a faculty member. Members of the Montreal business community may act as resource consultants.

45.6.1 Post M.B.A. Certificate

The Post M.B.A. Certificate will be awarded after the equivalent of one-term of residence and the successful completion of 15 credits of M.B.A. courses.

The certificate meets the needs of two groups of professional managers: (1) managers who graduated from an M.B.A. Program several years ago and would like to take a series of courses to update their skills; and, (2) managers who graduated from an M.B.A. Program recently and who would like to broaden the base of their education with a selection of courses that complement their major field of studies. The certificate may be taken on a full-time or part-time basis.

The entrance requirement is an M.B.A. degree from a recognized university with a CGPA that meets the minimum requirements of the Faculty of Graduate Studies (a TOEFL to determine the English proficiency of non-Canadians may be also be required).

45.7 Other Master Programs

45.7.1 Master of Arts in Economic Policy Management

In 1994, McGill University, assisted by the African Capacity Building Foundation and the Economic Development Institute of the World Bank, established a program in Economic Policy Management offering a solid foundation in macroeconomics and microeconomics combined with training in management. The program is for experienced policy advisors with superior promise and ability.

The program emphasizes practical applications of economic theory in the diverse contexts facing developing and emerging market and transitional economies in the 1990s, as well as the management skills needed for effective policy formulation and realization. It consists of 12 months of course work, seminars and integrative exercises, followed by a four-month practical internship.

Course selections are available as electives for students wishing to concentrate on Education Policy, Environmental Policy, Trade & Industrial Policy, Financial Sector Policy, Health Policy, Macroeconomic Policy, Infrastructure Management, Development Policy and Urban Planning Policy. Successful completion leads to a Master of Arts in Economic Policy Management from McGill University.

The 2000-20001 program begins in May, 2000. Women and men interested in the program should send a brief résumé of their professional and academic experience in order to receive an application.

The program is offered jointly by the McGill Faculty of Management and the Department of Economics, and administered by the Faculty of Management. Candidates must secure their own funding to cover all program, living, travel and associated costs.

The completed application must be returned by September 10, 1999, to:

Admissions Office,
Economic Policy Management Program,
Faculty of Management,
McGill University,
1001 Sherbrooke Street West,
Montreal (Quebec), Canada H3A 1G5.

Telephone: (514) 398-4005 Fax: (514) 398-2499
Telex: 05 268510

Email: epm@management.mcgill.ca
Website: http://www.management.mcgill.ca/programs/epm/epm.htm

45.7.2 Master of Management Programs (M.M.)

Master in Manufacturing Management (56 credits)
The Master in Manufacturing Management program (M.M.M.) is offered to students who wish to have a career as manufacturing managers. The program sets a curriculum in manufacturing and management subjects as well as providing exposure to industry through case studies, seminars and a paid industry internship. The M.M.M. program is a 12-month academic program starting in September followed by a 4-month industrial internship. The program is offered in collaboration with the Faculty of Engineering, and the Master of Management degree is granted jointly by the Faculties of Engineering and Management.

Students should hold an undergraduate degree in engineering or science. Two to five years industrial experience is preferred, but not mandatory. Students with other academic backgrounds and appropriate industrial experience will be considered. The program is intended for full-time as well as part-time students. Enrollment is limited.

The M.M.M. program is a self-funded program. Tuition is $25,000.

Students will take courses in the following areas.

MANAGEMENT SEGMENT

277-608	(3)	Data, Decisions and Models
272-632	(3)	Group Dynamics and Interpersonal Behaviour
279-603	(3)	Industrial Relations
280-611	(2)	Financial Accounting
280-612	(2)	Organizational Behaviour
280-615	(2)	Finance
280-616	(2)	Marketing

MANUFACTURING SEGMENT

277-601	(3)	Management eof Technology in Manufacturing
277-602	(3)	Manufacturing Strategy
277-603	(3)	Logistics Management
277-605	(3)	Total Quality Management
277-631	(3)	Analysis of Manufacturing Systems
305-524	(3)	Computer Integrated Manufacturing
305-526	(3)	Manufacturing and the Environment

For more information, students should contact the Program Coordinator, Mechanical Engineering at (514) 398-76201, fax: (514) 398-7365 or the Masters Program Office, Faculty of Management at (514) 398-4648, fax: 398-2499. Website: http://www.mecheng.mcgill.ca/grad/mmm

International Masters Programs in Practising Management (IMPM)

Functioning within an authentically international context, this cooperative venture of business schools located in five different countries allows mid-career executives to study topical international business problems on site at universities in France, England, India, Japan and Canada.

For more information visit our Website (http://www.impm.com).

McGill/McConnell Program for National Voluntary Sector Leaders

The program is designed for senior and emerging leaders of Canada's national voluntary organizations. The need for a program such as this is clear; national voluntary organizations are a critical component of the country's social and civic fabric and at the present time they are being called upon to address a host of significant changes that have national and long-term impact. The program content is organized around leadership mindsets which examine a set of concepts and competencies that voluntary sector leaders require to operate most effectively in a given context.

For more information visit our Website (http://www.management.mcgill.ca/exec/vleaders/index.htm).

45.8 Joint Ph.D. in Administration

The Ph.D. Program in Administration is offered jointly by the four Montreal universities: Concordia University, École des Hautes Études Commerciales (affiliated with the Université de Montréal), McGill University, and Université du Québec à Montréal. The program is intended to educate competent researchers and to stimulate research on management problems.

The program represents a number of innovations in doctoral work in the field of administration. First, by cooperating, the four universities are able to make available to the students a diverse pool of approximately 300 professors qualified to direct doctoral level study and research. Second, the program has been carefully developed to encourage independent, creative work on the part of its students, with close, personal contact with the professors. This program will appeal especially to the mature, experienced candidate with relatively well-defined interests. Third, the doctoral program has a language requirement; the program is bilingual with some courses, including the compulsory ones, taught partly in English and partly in French. Applicants must attain a level of competence that would allow them to read technical material and to follow lectures and discussions in both languages. (All papers may, however, be written in English or French.) This is viewed as a definite advantage of the program for those students who expect to work in Canada or francophone countries after graduation.

The program places considerable emphasis on the theoretical foundations of administration and its underlying disciplines. Graduates of the program are expected to have: (1) some knowledge of all the main areas of administration, (2) a thorough knowledge of one applied area of administration, and one support discipline, (3) a complete command of the research methodologies used in administration, and (4) some familiarity with modern theories and methods of the pedagogy of administration.

The program consists of three phases: preparation, specialization and dissertation.

Phase I Preparation

The preparation phase is intended to give each student some understanding of the range of subject matter that makes up contemporary administrative theory. On entering the program, the background of each student will be judged in each of the following areas. Deficiencies, if any, are to be made up by M.B.A. courses, papers, or assigned readings in:

- Behavioural Science
- Economics
- Management Science
- Marketing
- Finance
- Management Policy
- Accounting and Control

Some students – notably those with strong Master's degrees in administration or related disciplines – have a minimum of work in Phase I; others require up to one academic year of work. In addition, in Phase I all students take a seminar, Fundamentals of Administrative Thought (Course 278-704), which introduces them to the basic concepts of scientific inquiry, and relates this to the history of administrative thought, its various schools, and contemporary issues in the study of administration. This seminar is offered jointly by professors from the four universities. Also in Phase I, students must pass a qualifying examination in statistical methods.

Phase II – Specialization

In Phase II, students probe deeply into their chosen area of specialization. With their advisory committee, students work out an individual program of study which takes about 18 months. The specialization phase focusses on one applied area and one support field. The applied area could be one of the basic ones listed in Phase I (for example, management policy or management science), a sub-area within one of these (such as organizational development within organizational behaviour), or an interdisciplinary area that combines two or more of these (such as behaviour aspects of accounting or international marketing). In general, the program does not define fixed areas of specialization, but rather accepts the area of interest defined by the student, so long as there exists a sufficiently strong core of faculty members interested in that area to supervise the student.

The support field is selected to help the student develop a foundation of knowledge in a fundamental discipline that underlies the theory in administration. For example, a student in marketing might select psychology, sociology, or statistics. One in international business might select economics or anthropology. One in management policy might select political science or general systems theory or perhaps even philosophy. Many other choices are possible.

Students officially enter Phase II of the program when their advisory committee has been established and, together with the student, formally agrees on a proposal for the work to be done in Phase II. This includes the following:

- A major theory paper (278-720), equivalent to about three months of full-time work.
- Doctoral seminars in the applied area (or an equivalent reading course if the number of students studying in the area in a given year does not justify a seminar); minimum four courses.
- Any other existing graduate level courses in the applied area and support field deemed appropriate by the advisory committee; minimum two courses in support field.
- Seminar on Research Methods (278-707) taken in common by all Phase II students.
- Seminar in Pedagogy (278-706), or equivalent as defined by Program Committee, taken in common by all Phase II students.
- A detailed bibliography on which the student will be examined in a Comprehensive Examination (278-701), the last step in Phase II.

The advisory committee will normally consist of three or four persons; a chair and others decided upon jointly by the chair and the student. One of these members will typically come from the support field. At least one other of the participating universities must be represented on every student's advisory committee.

Phase III – Dissertation

The third phase of the program consists of the dissertation in the course of which the student probes deeply into a well-defined research topic. The topic is developed with the thesis committee (at least three members), which may be the same as the Phase II advisory committee or may be reconstituted, again with representation from at least one of the other participating universities. The topic is approved formally by the thesis committee and, once the research is completed and the dissertation written, the student publicly defends the completed thesis as the last step in the Ph.D. program.

ADMISSION – JOINT PH.D.

Candidates will normally hold an M.B.A. or other related Master's level degree, with a strong academic record from a recognized university. In certain cases, candidates without related Master's degree but with exceptional backgrounds may be considered for the program. Experience judged relevant to the course of study will be considered a desirable feature of the applicant's background.

A recent GMAT score (within 5 years) and two recent letters of recommendation are required as part of the application.

Students may apply for admission to one or more of the participating universities.These applications will be processed by both the individual university and the joint committee of the four schools. Students' preferences will prevail when more than one participating university is prepared to accept them. The Ph.D. degree will be granted by the university that admits the student. The program requires a minimum full-time residency of six semesters.

These applications must be completed by February 1st for September admission. January admissions are exceptional and subject to the approval of the Program Director.

Completed McGill application forms should be sent to:

Program Coordinator, Ph.D. Program
Faculty of Management
McGill University
1001 Sherbrooke Street West
Montreal, QC H3A 1G5

Telephone: (514) 398-4074
Fax: (514) 398-3876
Email: phd@management.mcgill.ca

The addresses of the three other institutions are:

Concordia University,Faculty of Commerce and Administration, 1455 de Maisonneuve Blvd West, Montreal, QC H3G 1M8

École des Hautes Études Commerciales, 3000 Chemin de la Cote Ste-Catherine, Montréal, QC H3T 2A7

Université du Québec à Montréal, Département des Sciences Administratives, 315 Ste-Catherine Est, Montréal, Québec H3C 4R2

46 Mathematics and Statistics

Department of Mathematics and Statistics
Burnside Hall
805 Sherbrooke Street West
Montreal, QC
Canada H3A 2K6
Telephone: (514) 398-3800
Fax: (514) 398-3899
Email: gradprog@math.mcgill.ca
Website: http://www.math.mcgill.ca

Chair — Georg Schmidt

Chair of Committee on Graduate Affairs — William J. Anderson

46.1 Staff

Emeritus Professors
J. Lambek; M.Sc., Ph.D.(McG.), F.R.S.C.*(Peter Redpath Emeritus Professor of Pure Mathematics)*
W.O.J. Moser; B.Sc.(Manit.), M.A.(Minn.), Ph.D.(Tor.)

Professors
W.J. Anderson; B.Eng., Ph.D.(McG.)
M. Barr; A.B., Ph.D.(Penn.) *(Peter Redpath Professor of Pure Mathematics)*
W. Brown; B.A.(Tor.), M.A.(Col.), Ph.D.(Tor.)
M. Bunge; M.A., Ph.D.(Penn.)
J. Choksi; B.A.(Cantab.), Ph.D.(Manc.)
S. Drury; M.A., Ph.D.(Cantab.)
K. Gowrisankaran; B.A., M.A.(Madr.), Ph.D.(Bomb.)
J. Hurtubise; B.Sc.(Montr.), D.Phil.(Oxon.)
N. Kamran; B.Sc., M.Sc.(Bruxelles), Ph.D.(Wat.)
M. Makkai; M.A., Ph.D.(Bud.)
S. Maslowe; B.Sc.(Wayne St.), M.Sc., Ph.D.(Calif.)
A. Mathai; M.Sc.(Kerala), M.A., Ph.D.(Tor.)
C. Roth; M.Sc.(McG.), Ph.D.(Hebrew)
K.P. Russell; Vor. Dip.(Hamburg), Ph.D.(Calif.)
G. Schmidt; B.Sc.(Natal), M.Sc.(S.A.), Ph.D.(Stan.)
G. Styan; M.A., Ph.D.(Col.)
K.K. Tam; M.A., Ph.D.(Tor.)
J. Taylor; B.Sc.(Acadia), M.A.(Queen's), Ph.D.(McM.)
K.J. Worsley; B.Sc., M.Sc., Ph.D.(Auck.)
S. Zlobec; M.Sc.(Zagreb), Ph.D.(Northwestern)

Associate Professors
H. Darmon; B.Sc.(McG.), Ph.D.(Harv.)
W. Jonsson; M.Sc.(Manit.), Dr.Rer.Nat.(Tubingen)
O. Kharlampovich; M.A., (Ural State), Ph.D.(Lenin.), Dr. of Sc., (Steklov Inst.)
I. Klemes; B.Sc.(Tor.), Ph.D.(Cal.Tech.)
J. Labute; B.Sc.(Windsor), M.A., Ph.D.(Harv.)
B. Lawruk; M.Sc., Ph.D.(Lwow)
J. Loveys; B.A.(St.Mary's), M.Sc., Ph.D.(S. Fraser)
R. Rigelhof; B.Sc.(Sask.), M.Sc.(Wat.), Ph.D.(McM.)
N. Sancho; B.Sc., Ph.D.(Belf.)
D. Sussman; M.A., Ph.D.(McG.)
J. Turner; B.Sc.(Tor.), Ph.D.(Birm.)
D. Wolfson; M.Sc.(Natal), Ph.D.(Purdue)
J.J. Xu; B.S.(Beijing), Ph.D.(Ren. Poly.)

Assistant Professor
J.A. Toth; B.Sc., M.Sc.(McM.) Ph.D.(M.I.T.)

Adjunct Professors
T. Fox; B.A.(Oakland), M.Sc., Ph.D.(McG.)
V.P. Havin; M.Sc., Ph.D.(Leningrad)
R. Murty; B.Sc.(Car.), Ph.D.(M.I.T.), F.R.S.C.
B. Rowley; B.Sc.(Wat.), M.Sc., Ph.D.(McG.)
R.A. Seely; B.Sc.(McG.), Ph.D.(Cantab.)

Associate Members
L.P. Devroye *(Computer Science);* P.R.L. Dutilleul *(Plant Science);* L.Glass *(Physiology);* J.-L. Goffin *(Management);* L. Joseph *(Epidemiology & Biostatistics);* M. Mackey *(Physiology);* L.A. Mysak *(AOS);* P. Panangaden *(Computer Science);* J.O. Ramsay *(Psychology);* G.A. Whitmore *(Management)*

46.2 Programs Offered

The brochure “Information for Graduate Students in Mathematics and Statistics”, available on the Department website, supplements the information contained in this Calendar.

The Department offers both a Master’s degree (in the form of an M.A. or an M.Sc.) and a Ph.D. degree.

By the choice of courses and thesis (or project topic) these degrees can be focussed in applied mathematics, pure mathematics or statistics.

The Institut des Sciences Mathématiques (ISM), among other activities, coordinates intermediate and advanced level graduate

courses among the following universities: Concordia University, Université Laval, McGill, Université de Montréal, UQAM, Université de Sherbrooke. A list of courses available under the ISM auspices at the other universities can be obtained by consulting the ISM website (http://www.math.uqam.ca/ISM/). The ISM also offers fellowships and promotes a variety of joint academic activities greatly enhancing the mathematical environment in Montreal and indeed in the province of Quebec.

46.3 Admission Requirements

In addition to the general Graduate Faculty requirements the Department requirements are as follows:

Master's Degree

The normal entrance requirement for the Master's programs is a Canadian Honours degree or its equivalent, with high standing, in mathematics, or a closely related discipline in the case of applicants intending to concentrate in statistics or applied mathematics. For applicants intending to continue in a doctoral program, an Honours degree or its equivalent is the preferred background.

Applicants wishing to concentrate in pure mathematics should have a strong background in linear algebra, abstract algebra, and real and complex analysis.

Applicants wishing to concentrate in an applied area of statistics should have a strong background in matrix algebra, advanced calculus and undergraduate statistics; some knowledge of computer programming and numerical analysis is also desirable.

Applicants wishing to concentrate in applied mathematics should have a strong background in linear algebra, real and complex analysis, ordinary differential equations and numerical analysis. Some knowledge of computer programming is also desirable.

Students whose preparation in mathematics is insufficient may have to register for a Qualifying Year.

Ph.D. Degree

Students normally enter the Ph.D. program after completing a Master's degree program with high standing.

46.4 Application Procedures

Applications will be considered upon receipt of:

1. Application form
2. Transcripts
3. Two letters of reference
4. $60 application fee
5. TOEFL test results (if applicable)

All information is to be submitted directly to the Graduate Secretary in the Department of Mathematics and Statistics.

Deadline: Applicants are urged to submit complete applications by March 1 for September admission, or by August 1 for January admission.

46.5 Program Requirements

Master's Degrees

Students must choose between the thesis option, which requires a thesis (24 credits) and 6 approved courses for a total of at least 22 credits, and the project option, which requires a project (15 credits) and 8 approved courses for at least 30 credits. Normally students must declare which option they choose to follow after one semester. It is expected that the degree be completed in at most four semesters.

The choice of courses must be approved by the advisor or thesis supervisor as well as by the Chair of the Committee on Graduate Affairs.

Some suggestions for the choice of courses in the Master's programs are:

- For students in applied mathematics: at least two of the following course sequences: 189-487 and 189-560; 189-578 and 189-579; 189-586 and 189-585.
- For students in pure mathematics: at least two of the following course sequences: 189-564, 189-565 and 189-566; 189-570 and 189-571; 189-576 and 189-577.
- Students in statistics are required to take 189-556 and 189-557 and, if they intend to continue in a doctoral program, they should also take 189-587 and 189-589.

Master's students who wish to keep open the possibility of continuing in a doctoral program should adhere closely to these suggestions since they will provide the background necessary for the comprehensive examination which all doctoral students are required to pass.

Further courses can be chosen from the departmental list of course offerings. A comprehensive list of courses, from which annual offerings are selected, is given below.

Ph.D. Degree

To complete a Ph.D. program students must:

a) pass twelve approved courses beyond the Bachelor's level ;
b) pass a Comprehensive Examination consisting of a written Part A, which is concerned with their general mathematical background, and an oral Part B concerned with two topics at an advanced graduate level;
c) demonstrate facility in reading mathematical articles in English and French;
d) submit a thesis judged to be an original contribution to knowledge.

46.6 Courses

- Denotes not offered in 1999-2000.

This Calendar is prepared long before it is known precisely which courses will be offered. In 1999-2000 most 500-level and approximately 15 of the 600- and 700-level courses will be given. Students should consult the Departmental website for an updated list of offerings.

NOTE: With the permission of the instructor, prerequisites and corequisites for courses may be waived in individual cases.

189-523B GENERALIZED LINEAR MODELS. (4) (Prerequisite: 189-423 or 513-697) (Not open to students who have taken 189-426.) Modern discrete data analysis. Exponential families, orthogonality, link functions. Inference and model selection using analysis of deviance. Shrinkage (Bayesian, frequentist viewpoints). Smoothing. Residuals. Quasi-likelihood. Sliced inverse regression. Continency tables: logistic regression, log-linear models. Censored data. Applications to current problems in medicine, biological and physical sciences. GLIM, S, software.

189-524A NONPARAMETRIC STATISTICS. (4) (Prerequisite: 189-324 or equivalent.) (Not open to students who have taken 189-424.) Distribution free procedures for 2-sample problem: Wilcoxon rank sum, Siegel-Tukey Smirnov tests. Shift model: power and estimation. Single sample procedures: Sign, Wilcoxon signed rank tests. Nonparametric ANOVA: Kruskal-Wallis, Friedman tests. Association: Spearman's rank correlation, Kendall's tau. Goodness of fit: Pearson's chi-square, likelihood ratio, Kolmogorov-Smirnov tests. Statistical software packages used.

189-555 FLUID DYNAMICS. (4) Kinematics. Dynamics of general fluids. Inviscid fluids, Navier-Stokes equations. Exact solutions of Navier-Stokes equations. Low and high Reynolds number flow.

189-556A MATHEMATICAL STATISTICS I. (4) (Prerequisite: 189-357) Probability and distribution theory (univariate and multivariate). Exponential families. Laws of large numbers and central limit theorem.

189-557B MATHEMATICAL STATISTICS II. (4) (Prerequisite: 189-556) Sampling theory (including large-sample theory). Likelihood functions and information matrices. Hypothesis testing, estimation theory, and decision theory. Regression and correlation theory.

189-560 OPTIMIZATION. (4) (Prerequisites: undergraduate background in analysis and linear algebra, with instructor's approval.)

Classical optimization in *n* variables. Convex sets and functions. Optimality conditions for single-objective and multi-objective non-linear optimization problems with and without constraints. Duality theories and their economic interpretations. Optimization with functionals. Connections with calculus of variations and optimal control. Stability of mathematical models. Selected numerical methods.

189-561 ANALYTICAL MECHANICS. (4) (Prerequisites: 189-354 and 189-380 or instructor's approval.) Basic differential geometry. Lagrangian formulation: Euler-Lagrange equations, Noether's theorem, applications. Hamiltonian formalism: symplectic forms and Legendre transformation, symmetry and conserved quantities, completely integrable systems, Poisson brackets.

189-564A ADVANCED REAL ANALYSIS I. (4) (Prerequisites: 189-354, 189-355 or equivalents.) Review of theory of measure and integration; product measures, Fubini's theorem; L spaces; basic principles of Banach spaces; Riesz representation theorem for C(X); Hilbert spaces; part of the material of 189-565B may be covered as well.

189-565B ADVANCED REAL ANALYSIS II. (4) (Prerequisite: 189-564) Continuation of topics from 189-564. Signed measures, Hahn and Jordan decompositions. Radon-Nikodym theorems, complex measures, differentiation in R^N. Fourier series and integrals, additional topics.

189-566B ADVANCED COMPLEX ANALYSIS. (4) (Prerequisites: 189-466, 189-564) Simple connectivity, use of logarithms; argument, conservation of domain and maximum principles; analytic continuation, monodromy theorem; conformal mapping; normal families, Riemann mapping theorem; harmonic functions, Dirichlet problem; introduction to functions of several complex variables.

189-570A HIGHER ALGEBRA I. (4) (Prerequisite: 189-371 or equivalent) Review of group theory; free groups and free products of groups, Sylow theorems. The category of R-modules; chain conditions, tensor products, flat, projective and injective modules. Basic commutative algebra; prime ideals and localization, Hilbert Nullstellensatz, integral extensions. Dedekind domains. Part of the material of 189-571B may be covered as well.

189-571B HIGHER ALGEBRA II. (4) (Prerequisite: 189-570 or consent of instructor.) Completion of the topics of 189-570. Rudiments of algebraic number theory. A deeper study of field extensions; Galois theory, separable and regular extensions. Semi-simple rings and modules. Representations of finite groups. Cohomology of finite groups if time permits.

● **189-574 ORDINARY DIFFERENTIAL EQUATIONS.** (4) (Prerequisites: 189-325,-354)

189-575 PARTIAL DIFFERENTIAL EQUATIONS. (4) (Prerequisite: 189-375A)

189-576A GEOMETRY AND TOPOLOGY I. (4) (Prerequisite: 189-354) Basic point-set topology, including connectedness, compactness, product spaces, separation axioms, metric spaces. The fundamental group and covering spaces. Simplicial complexes. Singular and simplicial homology. Part of the material of 189-577B may be covered as well.

189-577B GEOMETRY AND TOPOLOGY II. (4) (Prerequisite: 189-576) Continuation of the Topics of 189-576. Manifolds and differential forms. De Rham's theorem. Riemannian geometry. Connections and curvature. 2-Manifolds and imbedded surfaces.

189-578A NUMERICAL ANALYSIS. (4) (Prerequisites: A first course in numerical analysis – with programming – and a background in real and complex analysis, with Instructor's approval.) Errors in computation, vector and matrix norms. Iteration methods for roots in R^n and the complex plane. Interpolation including osculating and spline interpolation. Numerical differentiation and integration including Romberg and Gaussian methods and the Peano theorem. Matrix calculations with condition numbers and error bounds. Band matrices, eigenvalue calculations and applications to boundary value problems.

189-579 NUMERICAL DIFFERENTIAL EQUATIONS. (4) (Prerequisites: a background in ordinary and partial differential equations as well as numerical analysis, with instructor's approval.) Basic error analysis. Numerical solution of initial and boundary value problems for ordinary differential equations; simple, multiple shooting methods and finite difference methods. Finite difference methods for partial differential equations: parabolic equations, hyperbolic equations and elliptical equations, consistency, convergence and stability of numerical schemes. Explicit and implicit methods, alternating direction explicit and alternating direction implicit methods.

189-585 INTEGRAL EQUATIONS AND TRANSFORMS. (4) Integral transforms. Introduction to the theory of Hilbert spaces. Fredholm and Volterra integral equations; exact and approximate solutions. Equations with Hermitian kernels. Hilbert-Schmidt theorem and consequences. Representation formulas for the solutions of initial and boundary value problems. Green's functions. Applications.

189-586 APPLIED PARTIAL DIFFERENTIAL EQUATIONS. (4) (Prerequisites: 189-316, -375 or equivalent.) Partial differential equations of applied mathematics. Dirichlet and Newmann problems; complex variable methods. Homogeneous and non-homogeneous problems; Green's functions, integral transform methods, variational techniques. Pertubation theory. Applications.

189-587A ADVANCED PROBABILITY THEORY I. (4) (Prerequisite: 189-356 or equivalent and approval of instructor.) Probability spaces. Random variables and their expectations. Convergence of random variables in probability, almost surely, and in L^P Independence and conditional expectation. Introduction to martingales. Limit theorems including Kolmogorov's Strong Law of Large Numbers.

189-589B ADVANCED PROBABILITY THEORY II. (4) (Prerequisite: 189-587 or equivalent.) Characteristic functions : elementary properties, inversion formula, uniqueness, convolution and continuity theorems. Weak convergence. Central limit theorem. Additional topic(s) chosen (at discretion of instructor) from: martingale theory, Brownian motion, stochastic calculus.

189-591B MATHEMATICAL LOGIC I. (4) (Prerequisites: 189-488 or equivalent or consent of instructor.) Propositional logic and first order logic, completeness, compactness and Löwenheim-Skolem theorems. Introduction to axiomatic set theory. In the remaining time, a selection from the following topics: introduction to model theory, Herbrand's and Gentzen's theories, Lindström's characterization of first order logic.

189-592B MATHEMATICAL LOGIC II. (4) (Prerequisites: 189-488 or equivalent or consent of instructor.) Introduction to recursion theory; recursively enumerable sets, relative recursiveness. Incompleteness, undecidability and undefinability theorems of Gödel, Church, Rosser and Tarski. In the remaining time, a selection from the following topics: Turing degrees, Friedberg-Muchnik theorem, decidable and undecidable theories.

189-600A,B,C,L,T MASTER'S THESIS RESEARCH I. l(6) (Not open to students who have taken or are taking 189-640.) Thesis research under supervision.

189-601A,B,C,L,T MASTER'S THESIS RESEARCH II. (6) Thesis research under supervision.

189-604A,B,C,L,T MASTER'S THESIS RESEARCH III. (6) Thesis research under supervision.

189-605A,B,C,L,T MASTER'S THESIS RESEARCH IV. (6) Thesis research under supervision.

189-606 ALGEBRAIC TOPOLOGY. (4) (Prerequisite: 189-577B) Homology and Cohomology theories. Duality theorems. Higher homotopy groups.

189-608 LIE GROUPS AND LIE ALGEBRAS I. (4) Representation of linear groups and their Lie algebras. Commutative, nilpotent and solvable ideals of Lie algebras. Classification of classical simple Lie groups by means of Cartan's sub-algebras. Weights of irreducible representation and structure of semi-simple Lie algebras.

189-609 LIE GROUPS AND LIE ALGEBRAS II. (4) A continuation of the topics listed in the description of 189-608.

189-612 ALGEBRAIC CURVES. (4) A concrete introduction to algebraic geometry. Topics may vary from year to year and will include: plane algebraic curves, function fields in one variable, linear series and the theory of Riemann-Roch, elliptic curves.

189-614 THEORY OF RINGS. (4) Rings and modules. Prime and maximal ideals. Radicals. Semi-simple Artinian rings, semiperfect rings, semiprime Noetherian rings. Projective, injective and flat modules. Morita theory. Rings of quotients, localization and completion. Grouprings.

189-615 COMMUTATIVE ALGEBRA. (4) Localization and completion. Primary decomposition. Dimension theory. Homological theory of Noetherian rings. Regular sequences Kähler differentials. Unramified, smooth and étale extensions. The spectrum of a commutative ring and other applications to algebraic geometry.

189-616 HOMOLOGICAL ALGEBRA. (4) Modules. Diagrams. Free, injective, projective and flat modules. Tensor product and Hom. Derived functors. Dimension theory. Local rings. Cohomology of groups.

189-622 CATEGORIES I. (4) Categories, functors, natural transformations. Adjoint functors and limits. Embeddings and completions. Algebraic categories and standard constructions. Abelian and homological categories. Categories and the foundations of mathematics.

189-623 CATEGORIES II. (4) A continuation of the topics listed in the description of 189-622.

189-624 APPLIED CATEGORY THEORY I. (4) Review of adjoint functors, triples and their algebras. Localization with applications to modules, topological spaces and sheaves. Duality theory with applications to Morita theory and the duality theorems of Pontrjagin, Stone, Gelfand and Kaplansky. Categories and deductive systems. Introduction to toposes. Applications to computer science and linguistics.

189-625 APPLIED CATEGORY THEORY II. (4) A continuation of the topics listed in the description of 189-624.

189-626 ADVANCED GROUP THEORY I. (4) The structure of groups. Special classes of groups. Representation theory. Additional topics to suit the class.

189-627 ADVANCED GROUP THEORY II. 4) A continuation of the topics listed in the description of 189-626.

189-628 MATHEMATICAL LINGUISTICS. (4) (Given in collaboration with the Department of Linguistics. Prerequisites: 189-328 or 104-360A, or equivalent.) Phrase structure, production, categorial and transformational grammars, with applications to fragments of English and French and to kinship systems. Machines for generating and recognizing sentences; parsers. Introduction to lambda calculus and type theory; logical form and Montague semantics.

189-631 COMPLEX FUNCTION THEORY I. (4) (Prerequisite 189-564, -565, and -566 or equivalent.) Advanced topics in one complex variable, and some topics in several complex variables.

189-632 COMPLEX FUNCTION THEORY II. (4) (Prerequisite 189-631) Topics in the theory of functions of several complex variables.

189-633 HARMONIC ANALYSIS I. (4) (Prerequisite 189-564, -565, and -566) Classical harmonic analysis on the circle (Fourier series) and on the line (Fourier integrals). A brief introduction to harmonic analysis on locally compact groups.

189-634 HARMONIC ANALYSIS II. (4) (Prerequisites: 189-633 and -635.) The contents of this course will consist of further topics in classical harmonic analysis and a more detailed study of abstract harmonic analysis on locally compact groups.

189-635 FUNCTIONAL ANALYSIS I. (4) (Prerequisite 189-564, -565, and -566) Banach spaces. Hilbert spaces and linear operators on these. Spectral theory. Banach algebras. A brief introduction to locally convex spaces.

189-636 FUNCTIONAL ANALYSIS II. (4) (Prerequisites: 189-564, 189-565, 189-635.) A continuation of the topics listed in the description of 189-635.

189-637 PARTIAL DIFFERENTIAL EQUATIONS. (4) A modern introduction to the theory of linear differential equations, using the theory of distributions and Fourier transforms.

189-639 INTRODUCTION TO POTENTIAL THEORY. (4) Classical potential theory. Dirichlet problem. Harmonic and superharmonic functions. Introduction to modern axiomatic potential theory.

189-640A,B,C,L,T PROJECT I. (6) (Not open to students who have taken or are taking 189-600) Project research under supervision.

189-641A,B,C,L,T PROJECT II. (9) Project research under supervision.

189-651 ASYMPTOTIC EXPANSION AND PERTURBATION METHODS. (4) Asymptotic series. Summation. Asymptotic estimation of integrals. Regular and singular perturbation problems and asymptotic solution of differential equations.

189-670 STOCHASTIC PROCESSES. (4) Basic concepts. Stationary and nonstationary processes. Correlation function. Power spectra. Linear systems. Mean square periodicity and Fourier series. Sampling theorems. Series expansions. Linear mean square estimation.

189-671 APPLIED STOCHASTIC PROCESSES. (4) Discrete parameter Markov chains, including branching processes and random walks. Limit theorems and ergodic properties of Markov chains. Continuous parameter Markov chains, including birth and death process. Topics selected from the following areas: renewal processes, Brownian motion, statistical inference for stochastic processes.

189-674 EXPERIMENTAL DESIGN. (4) Review of one-way and two-way analyses of variance; randomized block, Latin square and incomplete block designs; factorial designs, confounding, fractional replications; random and mixed models; split-plot designs; nested and hierarchical designs; response surface analysis. Weighted least squares. Analysis of variance with equal and unequal numbers in cells. Latin squares, complete factorial designs. Prediction and confidence bands, multiple comparisons. Random effects models.

189-676 MULTIVARIATE ANALYSIS. (4) Properties of the multivariate normal distribution. Central and noncentral Wishart distribution. Statistical inference for multivariate normal populations. Hotelling's T^2. The product-moment correlation coefficient. Canonical correlations. Multivariate linear models. Principal components. Factor analysis.

189-677 DECISION THEORY. (4) Formulation of the statistical decision problem. Bayes and minimax solutions. Hypothesis testing and estimation from the point of view of decision theory. Sequential analysis.

189-678 APPLIED STATISTICAL METHODS AND DATA ANALYSIS I. (4) Statistical data analysis, with special reference to applications of the main statistical methods to problems in medicine, biology, chemistry, etc. Extensive use of computer methods, especially subroutine packages for statistical data description, display and analysis.

189-679 APPLIED STATISTICAL METHODS AND DATA ANALYSIS II. (4) Same emphasis as 189-678 but with a different selection of statistical methods.

189-680 COMPUTATION INTENSIVE STATISTICS. (4) (Prerequisites: 189-556, 189-557 or permission of instructor) (Not open to students who have taken or are taking 513-680.) Introduction to a statistical computing language, such as S-PLUS; random number generation and simulations; EM algorithm; bootstrap, cross-validation and other resampling schemes; Gibbs sampler. Other topics: numerical methods ; importance sampling; permutation tests.

189-681 TIME SERIES ANALYSIS. (4) Stationary stochastic processes. Autocovariance and autocovariance generating functions. The periodogram. Model estimation. Likelihood function. Estima-

tion for autoregressive moving average and mixed processes. Computer simulation; diagnostic checking, tests with residuals. Estimation of spectral density; Bartlett, Daniell, Blackman-Tukey spectral windows. Asymptotic moments of spectral estimates.

189-682 MATRIX THEORY WITH STATISTICAL AND OTHER APPLICATIONS: (4) Inequalities for trace and rank. Generalized inverses; idempotent matrices. Schur complement. Factorizations into triangular and diagonal form; singular values. Normal matrices. Algebraic and geometric multiplicity. Computational procedures; Householder transformations, condition number. Applications to least squares. Courant-Fisher min-max theorem; related inequalities. Quadratic forms in normal variables: distribution, Characteristic function, cumulants and independance.

189-683 LINEAR MODELS. (4) General univariate linear models with full rank and with less than full rank. Best linear unbiased estimators. General linear hypothesis. Computational procedures.

189-684 APPLIED SAMPLING TECHNIQUES. (4) Sampling and subsampling of clusters (one-stage, two-stage, and multi-stage). Unequal probability sampling with and without replacement. Double-sampling procedures. Repetitive surveys. Non-sampling errors (analytical and practical treatment). Analytical surveys. Optimization problems in sampling. Topics in the foundations of sample surveys. Other recent developments.

189-686 SURVIVAL ANALYSIS. (4) (Prerequisites: 189-556, 189-557 or permission of instructor.) (Not open to students who have taken or are taking 513-686.) Parametric survival models. Nonparametric analysis: Kaplan-Meier estimator and its properties. Covariates with emphasis on Cox's proportional hazards model. Marginal and partial likelihood. Logrank tests. Residual analysis. Homework assignments a mixture of theory and applications. In-class discussion of data tests.

189-687 READING COURSE IN MATHEMATICAL LOGIC I. (4) A highly specialized study.

189-688 READING COURSE IN MATHEMATICAL LOGIC II. (4) A highly specialized study.

189-689 READING COURSE IN ALGEBRA I. (4) A highly specialized study.

189-690 READING COURSE IN ALGEBRA II. (4) A highly specialized study.

189-691 READING COURSE IN GEOMETRY AND TOPOLOGY I. (4) A highly specialized study.

189-692 READING COURSE IN GEOMETRY AND TOPOLOGY II. (4) A highly specialized study.

189-693 READING COURSE IN ANALYSIS I. (4) A highly specialized study.

189-694 READING COURSE IN ANALYSIS II. (4) A highly specialized study.

189-695 READING COURSE IN APPLIED MATHEMATICS I. (4) A highly specialized study.

189-696 READING COURSE IN APPLIED MATHEMATICS II. (4) A highly specialized study.

189-697 READING COURSE IN STATISTICS AND PROBABILITY I. (4) A highly specialized study.

189-698 READING COURSE IN STATISTICS AND PROBABILITY II. (4) A highly specialized study.

189-699 READING COURSE IN OPTIMIZATION. (4) A highly specialized study.

189-700A,B COMPREHENSIVE EXAMINATION: PART A. – WRITTEN

189-701A,B COMPREHENSIVE EXAMINATION: PART B. – ORAL

189-704 TOPICS IN MATHEMATICAL LOGIC I. (4)

189-705 TOPICS IN MATHEMATICAL LOGIC II. (4)

189-706 TOPICS IN GEOMETRY AND TOPOLOGY I.

189-707 TOPICS IN GEOMETRY AND TOPOLOGY II.

189-708 TOPICS IN GEOMETRY AND TOPOLOGY III.

189-709 TOPICS IN GEOMETRY AND TOPOLOGY IV.

(4 credits each)

189-720 TOPICS IN ALGEBRA I.

189-721 TOPICS IN ALGEBRA II.

189-722 TOPICS IN ALGEBRA III.

189-723 TOPICS IN ALGEBRA IV.

189-724 TOPICS IN ALGEBRA V.

189-725 TOPICS IN ALGEBRA VI.

(4 credits each) Each of these courses covers an advanced topic in some branch of algebra.

189-726 TOPICS IN NUMBER THEORY I.

189-727 TOPICS IN NUMBER THEORY II.

189-728 TOPICS IN NUMBER THEORY III.

189-729 TOPICS IN NUMBER THEORY IV.

(4 credits each) Each of these courses covers an advanced topic in number theory.

189-740 TOPICS IN ANALYSIS I.

189-741 TOPICS IN ANALYSIS II.

189-742 TOPICS IN ANALYSIS III.

189-743 TOPICS IN ANALYSIS IV.

189-744 TOPICS IN ANALYSIS V.

189-745 TOPICS IN ANALYSIS VI.

(4 credits each) Each of these courses covers an advanced topic in some branch of analysis.

189-756 TOPICS IN OPTIMIZATION I.

189-757 TOPICS IN OPTIMIZATION II.

189-758 TOPICS IN OPTIMIZATION III.

189-759 TOPICS IN OPTIMIZATION IV.

(4 credits each) Each of these courses covers an advanced topic in Optimization.

189-761 TOPICS IN APPLIED MATHEMATICS I.

189-762 TOPICS IN APPLIED MATHEMATICS II.

189-763 TOPICS IN APPLIED MATHEMATICS III.

189-764 TOPICS IN APPLIED MATHEMATICS IV.

189-765 TOPICS IN APPLIED MATHEMATICS V.

189-766 TOPICS IN APPLIED MATHEMATICS VI.

189-767 TOPICS IN APPLIED MATHEMATICS VII.

189-768 TOPICS IN APPLIED MATHEMATICS VIII. (4 credits each) Each of these courses covers an advanced topic in applied mathematics.

189-771 TOPICS IN STOCHASTIC PROCESSES I.

189-772 TOPICS IN STOCHASTIC PROCESSES II.

(4) Each of these courses covers an advanced topic in stochastic processes.

189-782 TOPICS IN STATISTICS AND PROBABILITY I.

189-783 TOPICS IN STATISTICS AND PROBABILITY II.

189-784 TOPICS IN STATISTICS AND PROBABILITY III.

189-785 TOPICS IN STATISTICS AND PROBABILITY IV.

(4 credits each) Each of these courses covers an advanced topic.

189-790D PH.D. LANGUAGE REQUIREMENTS.

189-791D SEMINARS IN MATHEMATICAL LOGIC. (6)

189-792D SEMINARS IN ALGEBRA. (6)

189-794D SEMINARS IN GEOMETRY AND TOPOLOGY. (6)

189-796D SEMINARS IN ANALYSIS. (6)

189-797D SEMINARS IN APPLIED MATHEMATICS. (6)

189-798D SEMINARS IN STATISTICS AND PROBABILITY. (6)