

environmental management training, the labouring poor, literacy, and foreign investment.

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

23 Dietetics and Human Nutrition

School of Dietetics and Human Nutrition
Room MS2-039, Macdonald-Stewart Building
Macdonald Campus, McGill University
21,111 Lakeshore Road
Ste-Anne-de-Bellevue, QC
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Director — K. Gray-Donald

23.1 Staff

Emeritus Professor

H.R. Neilson; B.H.S., M.Sc.(McG.)

Professors

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

Associate Professors

K. Gray-Donald; B.Sc., Ph.D.(McG.) (joint appt. with Epidemiology and Biostatistics, Faculty of Medicine)
T.A. Johns; B.Sc.(McM.), M.Sc.(Br.Col.), Ph.D.(Mich.) (joint appt. with Plant Science)
K.G. Koski; B.S., M.S.(Wash.), Ph.D.(Calif.) (joint appt. with McGill Nutrition and Food Science Centre, and Division of Experimental Medicine, Faculty of Medicine)
S. Kubow; B.Sc.(McG.), M.Sc.(Tor.), Ph.D.(Guelph)
L. Thibault; B.Sc., M.Sc., Ph.D.(Laval)

Assistant Professors

D.J. Bissonnette; B.Sc.(McG.), Ph.D.(Tor.)
L. Chan; B.Sc., M.Sc.(Hong Kong), Ph.D.(Lond.) (joint appt. with Natural Resource Sciences, and Food Science and Agricultural Chemistry)
O. Receveur; B.Sc., M.Sc., Ph.D.(Calif.)
L.J. Wykes; B.Sc., M.Sc., Ph.D.(Tor.)

Cross-Appointed Professors

F. Carli (Anaesthesia); K. Ciaflone (Medicine);
L.J. Hoffer (Medicine); E.B. Marliss (Medicine);
M.E. Scott (Parasitology); S. Young (Psychiatry)

Associate Members

L. Beaumier (Montreal Children's Hospital); S. Kermasha (Food Sc./Agr. Chem.); R. Gougeon (Medicine); J.F. Yale (Medicine)

Adjunct Professors

K.A. Cockell (Health Canada), J.S. Cohn (Clinical Research Inst. of Canada), S.-H. Shen (National Research Council Canada)

23.2 Programs Offered

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

Candidates may conduct research in areas of nutritional biochemistry, clinical nutrition, community or international nutrition. In addition, eligible candidates may complete the equivalent of a Dietetic Internship for membership in the professional association for registration as Dietitians and Nutritionists in Canada. The M.Sc. (Applied) provides an opportunity to undertake course work and an applied project or advanced professional practice. For details on eligibility, required courses, etc., please contact the University Coordinator (Email: starkey@agradm.lan.mcgill.ca).

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

23.3 Admission Requirements

M.Sc.

Applicants must be graduates of a university of recognized reputation and hold a B.Sc. degree equivalent to a McGill Honours degree in a subject closely related to the one selected for graduate work. This implies that about one-third of all undergraduate courses should have been devoted to the subject itself and another third to cognate subjects. Some Major Programs (at McGill and elsewhere) contain the necessary amount of specialization and may qualify the applicant for consideration. High grades are expected in courses considered by the School to be preparatory to the graduate program.

Admission for M.Sc. studies requires at least a cumulative grade point average (CGPA) in McGill University's credit equivalency of 3.2/4.0 during the last four full-time semesters of a completed Bachelor's degree program in nutrition or a closely related field.

Students with limitations in their academic background may be admitted into a qualifying program for a maximum of two semesters if they have met the School's minimum CGPA of 3.2 of 4.0.

Successful completion of a qualifying program does not guarantee admission to a degree program.

M.Sc. (Applied)

Candidates must have a B.Sc. (Nutritional Sciences) or equivalent, with a dietetic internship or, be eligible to enter a dietetic internship program. Six months work experience in dietetics/nutrition practice is required for admission into the program.

Ph.D.

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

23.4 Application Procedures

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

Student Affairs Office (Graduate Studies)
Macdonald Campus of McGill University
21,111 Lakeshore
Ste-Anne-de-Bellevue, Québec
H9X 3V9 CANADA
Telephone: (514) 398-7708
Fax: (514) 398-7968
Email: GRAD@macdonald.mcgill.ca

Applications will be considered upon receipt of a signed and completed application form, \$60 application fee, all official transcripts, two signed original letters of reference on official letterhead of originating institution, and (if required) proof of competency in oral and written English by appropriate exams.

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

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

1. Certified personal cheque in Cdn.\$ drawn on a Canadian bank;

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

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

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

Competency in English – Non-Canadian applicants whose mother tongue is not English and who have not completed an undergraduate degree using the English language are required to submit documented proof of competency in oral and written English, by appropriate exams, e.g. TOEFL (minimum score 550) or IELTS (minimum 6.5). The MCHE is not considered equivalent. Results must be submitted as part of the application. The University code is 0935 (McGill University, Montreal); department code is 31 (graduate schools), Biological Sciences - Agriculture.

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

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

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

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

23.5 Program Requirements

M.Sc.

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

M.Sc. (Applied)

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

Ph.D.

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

23.6 Courses

Some courses are given every second year.

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

382-501A NUTRITION IN DEVELOPING COUNTRIES. (3) (2 lectures and 1 seminar) (Prerequisite: Consent of instructor.) This course will cover the major nutritional problems in developing countries. The focus will be on nutrition and health and emphasize young children and other vulnerable groups. The role of diet and disease for each major nutritional problem will be discussed. **Staff**

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

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

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

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

382-602A,B ADVANCED NUTRITIONAL STATUS ASSESSMENT. (3) (1 lecture and 1 lab) (Prerequisites: courses in human nutrition, biochemistry and physiology.) The understanding and evaluation of dietary and anthropometric indices used in the nutritional assessment of individuals and groups. **Staff**

382-603A,B NUTRITIONAL TOXICOLOGY. (3) (Prerequisites: courses in human nutrition, biochemistry and physiology.) Combined lectures and tutorials cover topics in: mechanisms of nutrient modulation of xenobiotic toxicities; effects of nutrient excess and malnutrition on drug metabolism and toxicity; biogeography and hazards of environmental contaminants and food toxins; and nutrient effects on teratogenesis and carcinogenesis. **Professors Chan and Johns**

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

and permission of instructor.) An in-depth analysis of concepts and investigative approaches to in vivo metabolic nutrition research. Seminars will emphasize stable isotope kinetic studies. Visiting scientists and tours of other laboratories will expose students to different approaches to research.

Professor Wykes

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

Professor Gray-Donald

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

Staff

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

Staff

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

Professor Kubow

382-620A NUTRITION OF INDIGENOUS PEOPLES. (3) (Prerequisite: One course in nutritional sciences.) In depth study of nutritional and environmental issues related to indigenous people in Canada and elsewhere. Changing patterns of food use; health related to diet; systems of traditional and market food; techniques and ethics of nutritional and environmental research with indigenous peoples.

Professor Kuhnlein

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

382-696A,B HUMAN NUTRITION SEMINAR II. (3) Students will present a recent original research article in which the methods and data presentation will be critically analyzed. The article must be approved by the instructor.

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

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

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

For additional courses in nutrition, see the Department of Animal Science.

24 Earth and Planetary Sciences

Department of Earth and Planetary Sciences
Frank Dawson Adams Building
3450 University Street
Montreal, QC, Canada H3A 2A7
Telephone: (514) 398-6767
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Email: CAROL@EPS.MCGILL.CA
Website: <http://www.eps.mcgill.ca>

Chair — A.E. Williams-Jones

24.1 Staff

Emeritus Professors

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

Professors

J. Arkani-Hamed; B.Eng.(Tehran), Ph.D.(M.I.T.)
R. Doig; B.Sc., M.Sc., Ph.D.(McG.)
D. Francis; B.Sc.(McG.), M.Sc.(Br.Col.), Ph.D.(M.I.T.)
A.J. Hynes; B.Sc.(Tor.), Ph.D.(Cantab.)

O.G. Jensen; B.Sc., M.Sc., Ph.D.(Br.Col.)
 R.F. Martin; B.Sc.(Ott.), M.S.(Penn. St.), Ph.D.(Stan.)
 A. Mucci; B.Sc., M.Sc.(Montr.), Ph.D.(Miami)
 A.E. Williams-Jones; B.Sc., M.Sc.(Natal), Ph.D.(Queen's)

Associate Professors

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

Lecturer

S.T. Ahmedali

Associate Members

M. Bilodeau (Mining Engineering); B. Volesky (Chemical Engineering)

Research Associate

P. Lorrain

24.2 Programs Offered

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

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

AREAS OF RESEARCH

Economic Geology

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

Environmental Geology and Low Temperature Geochemistry

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

Geochronology

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

Igneous Petrology

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

Planetary Sciences

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

Sedimentary Geology

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

Tectonics

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

24.3 Admission Requirements

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

24.4 Application Procedures

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

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

24.5 Program Requirements

M.Sc. Degree (45 credits)

The M.Sc. degree program includes:

- 12 credits from formal graduate courses to be chosen with the approval of the research director and Director of Graduate Studies and
- a thesis (33 credits) to be submitted according to the rules of the Faculty and the Department.

Ph.D. Degree

The Ph.D. degree program comprises:

- an approved program of courses selected in consultation with the student's academic adviser, and approved by the Academic Standing Committee,
- a comprehensive oral examination at the end of the Ph.D.II, and
- research leading to a Ph.D. thesis followed by an oral defense.

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

24.6 Graduate Courses

- Denotes not offered in 1999-2000.

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

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

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

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

- **186-540B PHANEROZOIC GEOLOGY OF NORTH AMERICA.** (3)
- **186-542A CHEMICAL OCEANOGRAPHY.** (3) (Prerequisites: 180-213A,B, 180-257D or equivalents, or registration in Graduate Program in Oceanography.)
- **186-545B LOW TEMPERATURE GEOCHEMISTRY AND DIAGENESIS.** (3) (Prerequisites: 180-203A/213B, 186-212B, 186-312B)
- **186-546A DIAGENESIS OF SEDIMENTARY ROCKS.** (3) (2 lecture, 3 lab/seminars) (Prerequisites: 186-212B, 186-220B, 186-312A)
- **186-547A THERMOCHEMISTRY OF HIGH-TEMPERATURE GEOLOGICAL SYSTEMS.** (3) (Prerequisites: 180-203/4 or 180-213 or permission of instructor.)
- 186-548A MECHANISMS OF IGNEOUS PETROGENESIS.** (3) (2 hours lecture, 1 hour seminar) (Prerequisite: 186-423B) Investigation of the primary mechanisms causing the diversity of igneous rock compositions on the Earth, other planets, asteroids, and meteorite parent bodies. **Professor Baker**
- **186-549B HYDROGEOLOGY.** (3) (3 hours lecture, 1-2 hours lab) (Prerequisite: permission of the instructor)
- 186-550A SELECTED TOPICS IN EARTH & PLANETARY SCIENCES I.** (3) (2 hours seminar, permission of Department undergraduate adviser) Research seminar and readings in topics concerning some aspects of current development in geological sciences. **Staff**
- 186-551B SELECTED TOPICS IN EARTH & PLANETARY SCIENCES II.** (3) (2 hours seminar, permission of Department undergraduate adviser) Research seminar and readings in topics concerning some aspects of current development in geological sciences. **Staff**
- 186-570B COSMOCHEMISTRY.** (3) (3 hours lecture) (Prerequisites: 186-220B, 186-210A or permission of instructor.) Examines the implications of phase equilibria and the compositions of meteorites and the solar system for the formation and internal differentiation of the terrestrial planets and the nature of chemical fractionation processes in both planetary interiors and the solar system as a whole. **Professors Francis and Baker**
- 186-580A AQUEOUS GEOCHEMISTRY.** (3) (3 hours lecture) (Prerequisites: 186-210A, 186-212B or permission of instructor.) The use of chemical thermodynamics to study fluid-rock interactions with an emphasis on the aqueous phase. The course introduces basic concepts and discusses aqueous complexation, mineral-surface adsorption, and other controls on crustal fluid compositions. Applications range from considering contaminated groundwater systems to metamorphic reactions. **Professor Mucci**
- **186-590B APPLIED GEOCHEMISTRY SEMINAR.** (3) (3 hours seminar) (Prerequisite: permission of instructor.)
- **186-601A PETROLOGY OF FELSIC IGNEOUS ROCKS.** (3) (Prerequisite: 186-423A or equivalent.)
- **186-603B PETROLOGY OF MAFIC IGNEOUS ROCKS.** (3) (Prerequisite: 186-423A or equivalent.)
- 186-604D ORE PETROLOGY.** (6) (3 hours lecture or seminar) Application of geochemistry and petrology to the study of selected ore types. **Professor Williams-Jones**
- **186-613A REGIONAL STRUCTURAL ANALYSIS.** (3) (2 hours lectures, 2 hours lab)
- **186-631E FIELD STUDIES IN OROGENIC BELTS.** (3) (2-week field course in May, plus assigned papers)
- 186-632A TOPICS IN ADVANCED GEOPHYSICS I.** (3) (3 hours lecture, tutorial seminar) Selected, current topics in geophysical research as relevant to the background preparation of students registered for research degrees in geophysics. **Geophysics Staff**
- 186-633B TOPICS IN ADVANCED GEOPHYSICS II.** (See 186-632A for description)

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

- **186-638A EVOLUTION OF PLANETS.** (3)
- 186-644A TOPICS IN ADVANCED EARTH SCIENCES I.** (3) (3 hours lectures or seminars) A survey of a research topic of particular current interest. **Staff**
- 186-645B TOPICS IN ADVANCED EARTH SCIENCES II.** (3) (3 hours lectures or seminars) A survey of a research topic of particular current interest. **Staff**
- **186-646D TOPICS IN ADVANCED EARTH SCIENCES III.** (6) (3 hours lectures or seminars)
- **186-650A GREENSTONE BELTS.** (3) (2 hours lecture, 3 hours lab)
- **186-655B LITHOGEOCHEMISTRY OF ALTERED ROCKS.** (3) (2 hours lecture, 3 hours lab)
- **186-660D SEMINAR IN OCEANOGRAPHY.** (2)
- 186-697A,B THESIS PREPARATION I.** (9) Independent study, theoretical and/or laboratory work in connection with the development of an M.Sc. thesis. Success in the course is dependent on presentation of an adequate progress report to the supervisory committee.
- 186-698A,B THESIS PREPARATION II.** (12) Independent study, theoretical and/or laboratory work in connection with the development of an M.Sc. thesis. Success in the course is dependent on presentation of an adequate progress report to the supervisory committee.
- 186-699A,B THESIS PREPARATION III.** (12) Independent study, theoretical and/or laboratory work in connection with the development of an M.Sc. thesis. Success in the course is dependent on presentation of an adequate progress report to the supervisory committee.
- 186-700D PRELIMINARY DOCTORAL EXAMINATION.**
- **186-706D ADVANCED SEDIMENTOLOGY.** (6) (2 hours lectures or seminar and 3 hours lab)
- **186-708D ADVANCED STRATIGRAPHY.** (6) (3 hours lectures or seminar)
- 186-710A GEOTECTONICS.** (3) (2 hours lectures or seminars) Plate tectonics and orogenesis. Plate tectonics in the geologic past. Problems of tectonic evolution in Precambrian time. **Professor Hynes**
- 186-713A ECONOMIC GEOLOGY I.** (3) (3 hours seminar) (Prerequisite: undergraduate course in economic geology or permission of the instructor.) Physicochemical controls of hydrothermal mineral deposition. Discussion of fluid inclusion theory and application; stable isotope systematics, wall-rock alteration; ore mineral solubility and speciation; and mechanisms of mineral deposition. **Professor Williams-Jones**
- 186-713B ECONOMIC GEOLOGY II** (3) (3 hours seminar) (Prerequisite: undergraduate course in economic geology or permission of the instructor.) Genesis of hydrothermal mineral deposits. Discussion of geological setting, fluid and metal sources, method of metal transport, and factors controlling metal concentration for a selection of hydrothermal mineral deposit types. **Professor Williams-Jones**
- 186-715B INSTRUMENTAL ANALYSIS.** (3) (3 hours lectures, 3 hours lab) Application of analytical instrumental techniques to obtaining reliable chemical data from complex (geological and environmental) materials, and evaluation of the data in problem solving. Electron Microprobe Analysis (WDS and EDS), Scanning Electron Microscopy, X-ray Fluorescence Spectrometry, X-ray Diffraction,

Atomic Spectroscopy (Atomic Absorption, ICP and ICP-MS).
Neutron Activation Analysis. **Professor Ahmedali**

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

186-720D ASSIGNED READINGS AND SEMINAR. (6) (Ineligible for credit in M.Sc. Thesis program.) Field of study and director to be specified.

- **186-721D RECENT SEDIMENTS AND MARINE GEOLOGY.** (6) (3 hours seminar, lectures and assignments)

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

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

25 East Asian Studies

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Chair — K. Dean

Chair of Graduate Program — G. Fong

25.1 Staff

Professor

R.D.S. Yates; B.A., M.A.(Oxon.), M.A.(Calif.), Ph.D.(Harv.)

Associate Professors

K. Dean; B.A.(Brown), M.A., Ph.D.(Stan.)

G. Fong; B.A., M.A.(Tor.), Ph.D.(Br. Col.)

T. Lamarre; B.A.(Georgetown), M.A., Ph.D.(Chic.),
D.Sc.(Aix-Marseille II)

Assistant Professors

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

J. Solomon; B.A.(Brown), M.A., Ph.D.(C'nell)

Faculty Lecturers

J. Chang; B.A.(Taiwan), M.A.(Harv.)

S. Hasegawa; M.A.(Montr.)

M. Kim; B.A., M.A.(Montr.)

K. Merken; B.A.(Tor.), M.A., Ph.D.(Calif.), Ph.D.(Br.Col.)

B. Wang; B.A.(Heilongjiang), M.A.(Calgary)

25.2 Programs Offered

Master's in East Asian Studies (Ad Hoc).

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

25.3 Admission Requirements

General

TOEFL and GRE (if applicable).

Applicants who have an undergraduate degree from outside Canada will need to take the Graduate Record Examination. A minimum TOEFL score of 575 is required for all applicants whose native language is not English.

Master's

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

Ph.D.

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

25.4 Application Procedures

Applications will be considered upon receipt of:

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

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

Deadline: March 1st for September admissions

25.5 Program Requirements

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

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

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

Depending on the particular program of study, students who need further language training may take 9 credits in a third or fourth year modern Asian language, or 9 credits in a second Asian language, or 6 credits in a classical (literary) Asian language.

Students who wish to improve their Asian language abilities may take 18-credits in third and fourth year modern language and 9 credits of a second Asian language; or nine credits of a third or fourth year language and 6 credits in classical language.

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

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

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

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

There are four requirements for obtaining the Doctoral degree:

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

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

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

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

- 117-501A ADVANCED TOPICS IN JAPANESE STUDIES I.** (3)
117-502B ADVANCED TOPICS IN JAPANESE STUDIES II. (3)
117-503A ADVANCED TOPICS IN CHINESE STUDIES I. (3)
117-504B ADVANCED TOPICS IN CHINESE STUDIES II. (3)
117-515A,B SEMINAR: BEYOND ORIENTALISM. (3)
117-529A,B CONTEMPORARY CHINA: ANALYSIS OF CHANGE. (3)
117-530D FOURTH LEVEL CHINESE. (6)
117-537D CHINA TODAY THROUGH TRANSLATION. (6)
117-540D FOURTH LEVEL JAPANESE. (6)
117-543A,B CLASSICAL JAPANESE I. (3)
117-544A,B CLASSICAL JAPANESE II. (3)
117-547A,B ADVANCED READING AND TRANSLATION IN JAPANESE. (3)
117-550A,B CLASSICAL CHINESE POETRY. (3)
117-551A,B TECHNOLOGIES OF THE SELF IN EARLY CHINA. (3)
117-559A,B ADVANCED TOPICS IN CHINESE LITERATURE. (3)
117-562A,B JAPANESE LITERARY THEORY AND PRACTICE. (3)
117-563A,B IMAGES, IDEOGRAMS, AESTHETICS. (3)
117-564A,B STRUCTURES OF MODERNITY: JAPAN. (3)
117-569A,B ADVANCED TOPICS IN JAPANESE LITERATURE. (3)
117-580A,B JAPAN: THE SOCIOPOLITICAL FRAMEWORK. (3)
117-584A,B INDUSTRY IN JAPAN. (3)
117-590A,B MULTIPLE NARRATIVES OF THE "ORIENT". (3)
117-600A,B EAST ASIAN STUDIES I. (3)
117-601A,B EAST ASIAN STUDIES II. (3)
117-651A,B SEMINAR IN TAOIST STUDIES I. (3)
117-652A,B SEMINAR IN TAOIST STUDIES II. (3)
117-653A,B CHINESE POPULAR CULTURE I. (3)
117-654A,B CHINESE POPULAR CULTURE II. (3)
117-655A,B PREMODERN CHINESE POETRY. (3)
117-656A,B PREMODERN CHINESE NARRATIVE. (3)
117-657A,B WOMEN'S WRITINGS IN TRADITIONAL CHINA. (3)

- 117-660A,B SEMINAR: JAPANESE FICTION.** (3)
117-661A,B PREMODERN JAPANESE POETRY AND NARRATIVE. (3)
117-662A,B SEMINAR: POPULAR CULTURE IN JAPAN. (3)
117-663A,B SEMINAR: JAPANESE CULTURE AND THOUGHT. (3)
117-680A,B SEMINAR: SOCIAL CHANGE IN JAPAN. (3)
117-682A,B HEALTH AND WELFARE IN JAPAN. (3)
117-690A,B THESIS RESEARCH I. (3)
117-691A,B THESIS RESEARCH II. (3)
117-692A,B THESIS RESEARCH III. (3)
117-693A,B THESIS RESEARCH IV. (3)
117-694A,B THESIS RESEARCH V. (3)
117-695A,B THESIS RESEARCH VI. (3)
117-696D THESIS RESEARCH VII. (6)
117-700D EAST ASIAN STUDIES III. (6)
117-701D PH.D. COMPREHENSIVE. (6)
117-750A,B CHINESE LITERARY THEORY AND CRITICISM. (3)
117-780A,B SOCIAL STRATIFICATION IN JAPAN. (3)

Courses in Other Departments

Department of Anthropology

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

Department of History

101-611D Seminar in Traditional Chinese History. (6)

101-618A,B Readings in East Asian History. (3)

101-658D Seminar in Chinese History. (6)

101-668D Japanese Intellectual History. (6)

Department of Political Science

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

Faculty of Management

270-625A,B Asia Pacific Management. (3)

272-685A,B Cross Cultural Management. (3)

Faculty of Religious Studies

260-546A,B Indian Philosophy. (3)

260-548A,B Indian Buddhist Metaphysics. (3)

260-549A,B East Asian Buddhist Philosophy. (3)

260-557A,B Asian Ethical Systems. (3)

260-651A,B Indian Buddhist Philosophy. (3)

260-653A,B Visistadvaita Vedanta. (3)

260-655A,B Buddhist Epistemology. (3)

260-658A,B Japanese Buddhist Philosophy. (3)

260-687A,B Research in Comparative Religions I. (3)

26 Economics

Department of Economics

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Chair — Christopher Green

26.1 Staff

Emeritus Professors

Earl F. Beach; B.A.(Queen's), A.M., Ph.D.(Harv.)

Irving Brecher; B.A.(McG.), M.S., Ph.D.(Harv.)

Kari Polanyi-Levitt; B.Sc.(Lond.), M.A.(Tor.)

Professors

Robert D. Cairns; B.Sc.(Tor.), Ph.D.(M.I.T.)

Antal Deutsch; B.Com.(Sir G. Wms.), Ph.D.(McG.)

Christopher Green; M.A.(Conn.), Ph.D.(Wis.)
 Joseph Greenberg; B.A., M.A., Ph.D.(Heb. U. of Jer.)
 Jagdish Handa; B.Sc.(Lond.), Ph.D.(Johns H.)
 Ngo van Long; B.Ec.(LaT.), Ph.D.(A.N.U.)
 Robin Thomas Naylor; B.A.(Tor.), M.Sc.(Lond.), Ph.D.(Cantab.)
 J.C. Robin Rowley; B.Sc., M.Sc., Ph.D.(Lond.)

Associate Professors

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

Assistant Professors

Suryapratim Banerjee; Ph.D.(Boston)
 Curtis Eberwein; B.A., M.A.(U. of Akron), Ph.D.(Pitt.)
 Daniel Parent; B.A., M.A.(Laval), Ph.D.(Montr.)

Postdoctoral Fellow

Ian Keay; B.A., M.A.(McG.), Ph.D.(Br.Col.)

26.2 Programs Offered

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

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

26.3 Admission Requirements

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

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

26.4 Application Procedures

Applications will be considered upon receipt of:

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

All of the above should be submitted directly to the Graduate Coordinator.

Deadline: February 1st for financial consideration.

26.5 Program Requirements

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

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

I. Thesis Option:

The requirements for the Master's degree are:

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

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

A minimum of 6 credits must be taken in the same field.

2. Completion of a Master's thesis, the subject of which must be approved by a thesis committee.

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

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

II. Non-thesis option:

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

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

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

A minimum of 6 credits must be taken in the same field.

2. A research paper of about 50 pages in length.

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

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

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

Requirements for the Ph.D. Degree

The requirements for the doctoral degree are:

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

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

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

26.6 Courses for Higher Degrees

- Denotes not offered in 1999-2000.

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

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

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

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

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

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

154-602A,B ECONOMIC HISTORY. (3) Selected topics in European and North-American economic history are investigated from the standpoint of the interplay of institutional change and quantitative growth.

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

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

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

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

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

● **154-622,B PUBLIC FINANCE.** (3)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

● **154-712A,B PUBLIC FINANCE.** (3)

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

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

● **154-722A,B MACROECONOMICS.** (3)

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

154-734B ECONOMIC DEVELOPMENT. (3) Problems of economic growth and planning in selected underdeveloped countries. Topics covered vary from year to year in response to student interests; growth, poverty and income distribution, LDC labour markets and institutions, trade and development, international debt problems, issues in trade policy. **Professor Banerjee**

● **154-737B INDUSTRIAL ORGANIZATION AND REGULATION.** (3)

154-741B ADVANCED LABOUR ECONOMICS. (3) Selected theoretical and policy issues in labour economics. **Professor Parent**

154-742B EMPIRICAL MICROECONOMICS. (3) (Prerequisite: First term of 662D and either 634A or 641A, or consent of the instructor.) Surveys the empirical techniques used in applied microeconomic fields, particularly development and labour economics. Focus is on the formulation of empirical models derived from economic theory, and on various estimation methodologies, including panel data econometrics, limited dependent variable models, and duration analysis. A hands on approach is emphasized. **Professor Grimard**

● **154-744B HEALTH ECONOMICS.** (3)

154-750A SELECTED TOPICS IN MICROECONOMICS. (3) Topics of interest to the students and staff. These topics will be in areas other than those covered by existing courses and particular attention will be paid to critiques of neoclassical economic theory. **TBA**

● **154-751A,B SELECTED TOPICS IN MACROECONOMICS.** (3)

154-752B TOPICS IN FINANCIAL ECONOMICS. (3) Selected topics in monetary economics and international finance for advanced graduate work in this area. **Professor Bala**

● **154-753A SELECTED TOPICS IN MATHEMATICAL ECONOMICS.** (3)

● **154-760A,B HISTORY OF ECONOMIC THOUGHT.** (3)

● **154-761A,B ECONOMETRICS – TIME SERIES ANALYSIS.** (3) (Not open to students who have taken 154-762D.)

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

154-763A,B FINANCIAL ECONOMETRICS. (3) This course covers advanced time series methods used in the analysis of financial data and other potentially non-stationary time series. Topics: integrated time series, co-integration, unit root testing, conditional heteroscedasticity, long memory, non-parametric and neural network models. Applications include market efficiency, stochastic volatility and predictability of asset returns. **Professor Galbraith**

154-764B SELECTED TOPICS IN APPLIED ECONOMETRICS. (3) This course covers econometric tools used in applied microeconomics. The material includes limited dependent variable models: probit and logit, censored and truncated regression analysis (Tobit models), self-selection models. Discrete and continuous duration models will also be covered. Empirical application of these techniques to cross-sectional and panel data will be emphasized. **Professor Dagenais**

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

154-799D PH.D. COMPREHENSIVE EXAMINATION.

Courses Offered Only in Some Years

154-738A,B TOPICS IN ECONOMIC THEORY.

154-753B SELECTED TOPICS IN MATHEMATICAL ECONOMICS.

154-761A,B ECONOMETRICS-TIME SERIES ANALYSIS.

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Acting Chair — Robert J. Bracewell (January to June, 1999)

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Counselling Psychology — Theodore J. Maroun*

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Associate Program Director —

Joyce F. Benenson (Applied Developmental Psychology)

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Associate Program Directors —

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27.1 Staff

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