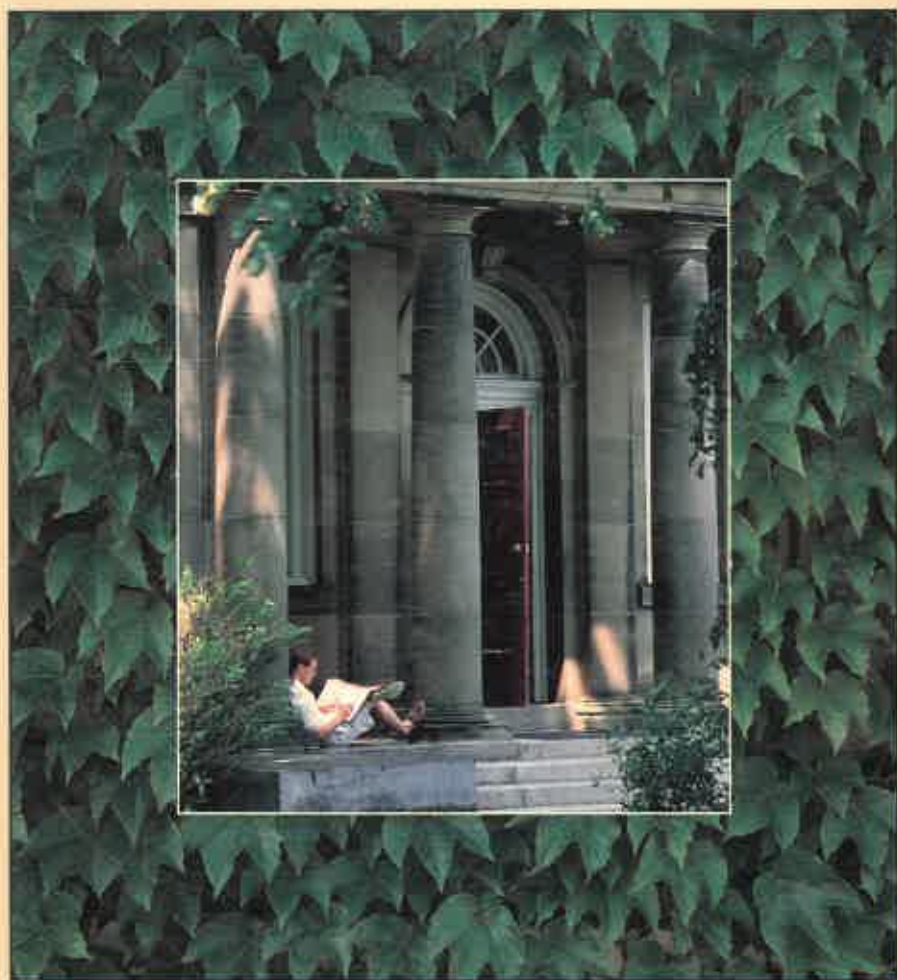


# DALHOUSIE

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# UNIVERSITY



**GRADUATE STUDIES  
CALENDAR**

**1991/92**

# **DALHOUSIE**

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U N I V E R S I T Y

## **GRADUATE STUDIES**

**1991/92  
CALENDAR**



## IMPORTANT NOTICES

Students are advised that the matters dealt with in this Calendar are subject to continuing review and revision. This Calendar is printed some months before the year for which it is intended to provide guidance. Students are further advised that the content of this calendar is subject to change without notice, other than through the regular processes of Dalhousie University, and every student accepted for registration in the University shall be deemed to have agreed to any such deletion, revision or addition whether made before or after said acceptance. Additionally, students are advised that this calendar is not an all-inclusive set of rules and regulations but represents only a portion of the rules and regulations that will govern the student's relationship with the University. Other rules and regulations are contained in additional publications that are available to the student from the registrar's office, and/or the relevant faculty, department or school.

The University reserves the right to limit enrolment in any programme. Students should be aware that enrolment in many programmes is limited and that students who are admitted to programmes at Dalhousie are normally required to pay deposits on tuition fees to confirm their acceptance of offers of admission. These deposits may be either non-refundable or refundable in part, depending on the programme in question. While the University will make every reasonable effort to offer classes as required within programmes, prospective students should note that admission to a degree or other programme does not guarantee admission to any given class, except those specified as required, within that programme. Students should select optional classes early in order to ensure that classes are taken at the most appropriate time within their schedule. In some fields of study, admission to upper level classes may require more than minimal standing in prerequisite classes.

Dalhousie University does not accept any responsibility for loss or damage suffered or incurred by any student as a result of suspension or termination of services, courses or classes caused by reason of strikes, lockouts, riots, weather, damage to university property or for any other cause beyond the reasonable control of Dalhousie University.

Inquiries should be directed to:

The Registrar  
Dalhousie University  
Halifax, Nova Scotia  
Canada  
B3H 4H6  
Tel: (902) 494-2450  
Fax: (902) 494-1630

Table of Contents

Admission Information . . . . .	4	Physics . . . . .	118
Schedule of Academic Dates . .	5	Physiology and Biophysics . . . . .	121
Definitions . . . . .	7	Political Science . . . . .	123
Dalhousie University . . . . .	8	Psychology . . . . .	125
Executive Officers . . . . .	8	Public Administration . . . . .	128
Board of Governors . . . . .	9	Recreation, Physical and Health	
Senate . . . . .	9	Education . . . . .	131
Academic Programmes . . . . .	10	Social Work . . . . .	134
Special Institutes . . . . .	11	Sociology and Social Anthropology . . . . .	136
Resources and Services . . . . .	13	Calendar . . . . .	137
Fees . . . . .	21	Campus Map . . . . .	138
University Regulations . . . . .	29	Index of Awards and Scholarships . . . . .	140
Faculty of Graduate Studies . .	34	General Index . . . . .	141
Faculty Regulations . . . . .	35		
Scholarships, Fellowships and Financial Assistance . . . . .	43		
Interdisciplinary Studies . . . . .	46		
Joint Programmes . . . . .	46		
Departmental Listings . . . . .	47		
Anatomy . . . . .	48		
Biochemistry . . . . .	49		
Biology . . . . .	51		
Business Administration . . . . .	56		
Chemistry . . . . .	62		
Classics . . . . .	64		
Economics . . . . .	66		
Education . . . . .	70		
English . . . . .	75		
Environmental Studies . . . . .	77		
French . . . . .	80		
Geology . . . . .	83		
German . . . . .	84		
Health Services Administration . . . . .	85		
History . . . . .	88		
Human Communication Disorders . . . . .	90		
Interdisciplinary Studies Programme . . . . .	92		
Law . . . . .	93		
Library and Information Studies . . . . .	97		
Marine Affairs . . . . .	100		
Mathematics, Statistics and Computing Science . . . . .	101		
Microbiology . . . . .	103		
Neuroscience . . . . .	105		
Nursing . . . . .	106		
Oceanography . . . . .	107		
Oral and Maxillofacial Surgery . . .	109		
Pathology . . . . .	110		
Pharmacology . . . . .	112		
Pharmacy . . . . .	113		
Philosophy . . . . .	116		

## 4 Admission Information

### Final Dates for Receipt of Applications for Admission

#### Regular Session

##### College of Arts & Science

Foreign Students (except USA) .....	May 1
BEd Programme .....	May 1
Students entering from Canada or US .....	July 1

##### Health Professions

BSc (Nursing), Outpost and Community Health Nursing, Occupational Therapy, Physiotherapy, Pharmacy, Social Work .....	March 1
BSc (Nursing) for Post RN <sup>1</sup> .....	June 1
Recreation, Physical & Health Education .....	July 1

##### Management

Foreign Students (except USA) .....	May 1
Students entering from Canada or US .....	July 1

Dentistry .....

December 1
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Dental Hygiene .....

February 1
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##### Medicine

MD .....	November 15
Post-Graduate .....	December 1

Law<sup>1</sup> .....

March 1
---------

Graduate Studies <sup>4</sup> (except as below) .....	July 15
Non-Canadian Students (except as below) .....	May 1
Marine Affairs and Law (doctoral level) .....	January 1
Human Comm. Disorders .....	March 1
Nursing, Health Ser. Admin. and Law (master's level) .....	May 1
Oral and Maxillofacial Surgery <sup>2</sup> .....	July 1
Social Work .....	February 15

#### Winter Term

Diploma/Outpost & Community Health Nursing for RN's .....	October 1
BA, BSc and BCom programmes only <sup>3</sup> .....	November 15

<sup>1</sup> Late applications may be considered up to August 1.

<sup>2</sup> Of year preceeding commencement of programme.

<sup>3</sup> Part-time and transfer students only.

<sup>4</sup> All supporting documentation must be submitted by the appropriate deadline

## Schedule of Academic Dates 1991-92

Classes offered at Dalhousie have one of the letters "A", "B", "C" or "R" following the number. "A" classes are given in the first term of any session, "B" classes are given in the second term of any session, and "R" and "C" classes are given throughout the entire session ("R" classes carry one full credit or more, "C" classes less than one full credit).

### 1991

#### May

8 Last day to register, Spring Session

13 Spring session begins

17 Last day to add "A", "C", and "R" classes, Spring session

20 Victoria Day - University closed

21-24 Spring Convocations

22 Last day to withdraw without academic penalty from "A" classes, Spring session

#### June

5 Last day to withdraw without academic penalty from "R" and "C" classes, Spring session

12 Last day to add "B" classes, Spring session

17 Last day to withdraw from "B" classes without academic penalty, Spring session

26 Last day to register, Summer session

28 Spring session ends

#### July

1 Canada Day - University closed

2 Summer session begins

8 Last day to add "A", "R" and "C" classes, Summer session

11 Last day to withdraw without academic penalty from "A" classes, Summer session

24 Last day to withdraw without academic penalty from "R" and "C" classes, Summer session

31 Last day to add "B" classes, Summer session

#### August

2 Last day for those expecting PhD degrees in October to submit unbound theses to departments

5 Halifax and Dartmouth Natal Day - University closed

6 Last day to withdraw from "B" classes without academic penalty, Summer session

16 Last day of classes, Summer session

27 First year MBA orientation begins

30 Last day for those expecting Masters degrees in October to submit unbound theses to departments

#### September

2 Labour Day - University closed

3 Registration ends in Law and Library and Information Studies

Registration ends and classes begin in MBA

Orientation begins, Human Communication Disorders (first year)

4 Classes begin in Library and Information Studies and Law

6 Last day to register, Regular session

9 Classes begin unless otherwise specified, Regular session

13 Last day for those expecting to receive graduate degrees in October to submit approved unbound copies of theses to Faculty of Graduate Studies Office

23 Last day to add "A", "C", and "R" classes

Last day to register with late fee

## 6 Schedule of Academic Dates

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### October

- 14 Thanksgiving Day - University closed
- 19 Fall Convocation
- 21 Last day to withdraw from "A" classes without academic penalty

### November

- 11 Remembrance Day - University closed
- 12 Last day for those expecting PhD degrees by approval of Senate in February to submit unbound theses to departments
- 29 Last day to change status (PT to FT or FT to PT), graduate students.

### December

- 5 Last day of classes
- 9 Examinations begin
- 13 Last day for those expecting Masters degrees by approval of Senate in February to submit unbound theses to departments
- 17 Examinations end

## 1992

### January

- 1 New Year's Day - University closed
- 6 Classes resume, Regular session  
  
Last day for those expecting to receive graduate degrees by approval of Senate in February to submit approved unbound copies of theses to Faculty of Graduate Studies office
- 20 Last day to add "B" classes  
  
Last day to withdraw from "C" and "R" classes without penalty

### February

- 7 Munro Day - University closed
- 14 Last date to withdraw from "B" classes without academic penalty
- 17 Study break begins
- 20 Last day for those expecting PhD degrees in May to submit unbound theses to departments

- 24 Classes resume

### March

- 2 Classes resume
- 24 Last day for those expecting Masters degrees in May to submit unbound theses to departments

### April

- 10 Last day of classes, Regular session
- 15 Last day for those expecting to receive graduate degrees in May to submit approved unbound copies of theses to Faculty of Graduate Studies Office  
  
Examinations begin, Regular session
- 17 Good Friday - University closed
- 29 Examinations end, Regular session

### May

- 19-27 Spring Convocations

## Definitions

The following definitions are intended to facilitate an understanding of the calendar and not to define all words and phrases used in the calendar which may have specific meanings.

**Academic Dismissal:** A student's required withdrawal from a programme due to unsatisfactory academic performance.

**Audit Student:** A student permitted to attend classes but not expected to prepare assignments, write papers, tests or examinations. Credit is not given nor is a mark awarded for classes. Classes appear on the transcript with the notation "Aud".  
**Audit students must apply, select classes and register in the normal way.**

**Class:** A unit of instruction in a particular subject identified by a name and number.

**Course:** The term "class" is used in place of this.

**Credit:** A unit by which University class work is measured. A full year class is normally worth one credit.

**Exclusion:** Students may not register for a class which lists, as an exclusion, a class the student is also taking or has already passed.

**Full-time Graduate Students:** Those carrying more than two and one-half (2 1/2) full-credit classes during the 12-month academic year or a student who has not yet completed the minimum number of years of full-time study required for a particular degree programme.

**Part-time Graduate Students:** Those carrying not more than two and one-half (2 1/2) full-credit classes during the 12 months, September to August or a student who has not yet completed the minimum number of years of part-time study required to complete the residency requirement for a particular degree programme.

**Mature Student:** A person who is at least 23 years old, does not meet the usual admission requirements and has been absent from full-time high school study for at least four years.

**Prerequisite:** Requirement which must be fulfilled prior to registering in a specific class.

### Academic sessions

Regular session:	September - April
Fall term:	September - December
Winter term:	January - April
Spring session:	May - June
Summer session:	July - August



## Dalhousie University

For over 125 years, Dalhousie University has played a crucial role in Nova Scotian higher education. Building upon a strong undergraduate base, the University has developed internationally recognized programmes of graduate and professional studies. The scope of its research is far-reaching, as is its public and community service. The range of the University's programmes, and in particular the obligations it has assumed for professional and graduate education, give it a unique role in higher education in Nova Scotia and in the Maritime region.

Dalhousie's enrolment stands at over 11,000 students. To accommodate them, Dalhousie occupies more than 60 acres in a residential area of Halifax. University facilities include buildings for teaching and research, libraries, residential housing for students, a Student Union Building, an Arts Centre for music, theatre, and an art gallery and facilities for physical recreation. The Nova Scotia Archive building, the Atlantic Regional Laboratory of the National Research Council, major provincial hospitals, and the Dr. D.J. MacKenzie Laboratories are located close to the University. Dalhousie benefits from a variety of arrangements for teaching and research collaboration with hospitals and federal and provincial research laboratories.

The University of King's College, situated adjacent to Dalhousie campus, is an affiliated institution, and its students in Arts and Science receive Dalhousie degrees in the name of both institutions. By agreement with Mount Saint Vincent University students have access to various courses and services. Cooperative arrangements for engineering and computer science studies have been made with the Technical University of Nova Scotia. By arrangement with the Nova Scotia Teachers College, graduates of that institution may complete education degree requirements at Dalhousie. Cooperation in a number of academic programmes, in administrative services, and in use of library resources is provided for in working arrangements with Saint Mary's University and other institutions in Halifax. Degrees in agriculture, awarded to students of the Nova Scotia Agricultural College, are awarded by Dalhousie in cooperation with the College.

Dalhousie University is a non-denominational co-educational university. Founded in 1818, the University is a member of the Association of Universities and Colleges of Canada, the Atlantic Association of Universities, and the Association of Commonwealth Universities.

### Executive Officers

#### President and Vice-Chancellor

Howard C. Clark, BSc, MSc, PhD, ScD, FRSC

### Vice-Presidents

**Academic and Research**  
 Denis Stairs, BA, MA, PhD, FRSC  
**Finance and Administration**  
 Bryan G. Mason, BA  
**Student Services**  
 Eric A. McKee, BA, MA  
**External**  
 Henry Eberhardt, AB

#### Associate Vice-President Research

Robert O. Fournier, BSc, MA, PhD

### Deans of Faculties

**Arts and Social Sciences**  
 Rowland J. Smith, BA, MA, PhD  
**Dentistry**  
 Kenneth Zakariassen, BA, DDS, MS, PhD  
**Graduate Studies**  
 Judith Fingard, BA, MPhil, PhD  
**Health Professions**  
 TBA  
**Law**  
 Innis Christie, BA, LLB, LLM  
**Management**  
 James D. McNiven, BA, MA, PhD  
**Medicine**  
 T.J. (Jock) Murray, MD, FRCP(C)  
**Science**  
 W.C. Kimmins, PhD

#### Henson College of Public Affairs and Continuing Education

J. Douglas Myers, BA, BEd, MA, PhD, Dean

#### School of Education

K.C. Sullivan, BSc, BEd, MEd, PhD, Director

#### College of Arts and Science

W.C. Kimmins, PhD, Provost

### Administrative Officers

#### University Secretary and Legal Counsel

Brian C. Crocker, QC, BA, LLB

#### University Librarian

William F. Birdsall, BA, MA, PhD

#### University Registrar

Gudrun E.L. Curri, MA

### Executive Directors

**Computer and Information Services**  
 H.S. Peter Jones, BSc, MSc, FBCS, FIMA  
**Instructional Development and Technology**  
 W. Alan Wright, BA, MA, PhD  
**Office of Institutional Planning and Analysis**  
 Brian Christie, BA, MA

**Directors**

**Alumni Affairs**  
 Elizabeth Flinn, BSc  
**Arts Centre**  
 Robert C. Reinholdt  
**Athletics and Recreational Services**  
 F.A. (Tony) Martin, BSc, MA  
**Counselling and Psychological Services**  
 Judith Hayashi, BA, MA  
**Financial Services**  
 TBA  
**Health Services**  
 Rosemary Gill, MD  
**Housing and Conferences**  
 Heather Sutherland, BSc, MEd  
**Personnel Services**  
 Michael J. Roughneen, CPIR, BA, MSc, FIPM  
**Physical Plant and Planning**  
 William Lord, BAsc, PENG  
**Public Relations**  
 Marilyn MacDonald, BA, MA

**Board of Governors**

Under the University's statutes, the Board of Governors is responsible for the operation of the University. The Board consists of representatives named by the Government of Nova Scotia, the alumni, the Student Union and certain other bodies. Internal regulation of the University is the primary concern of the Senate, subject to approval of the Board of Governors.

The President and Vice-Chancellor is the Chief Executive Officer of the University, responsible to the Board of Governors and Senate for supervision of the University's administrative and academic work.

**Chancellor**

H. Reuben Cohen, QC, BA, LLB, LLD

**Chancellor Emeritus**

Lady Beaverbrook, LLD

**Officers**

Dr. Howard C. Clark, BSc, MSc, PhD, ScD.  
 Mr. George C. Piercy, Q.C., Chairperson  
 Ms. Peggy Weld, Vice-Chair  
 Mr. Allan C. Shaw, Vice-Chair  
 Dr. Donna M. Curry, M.D., Honourary Secretary  
 Ms. Lorraine Green, Honorary Treasurer

**Members**

Mr. Charles Aldrich  
 Mr. David J. Almon  
 Dr. Marie Ann Battiste  
 Dr. D. Wayne Bell, M.D.  
 Mr. Aubrey D. Browne  
 Mr. Daniel M. Campbell  
 Dr. Mona L. Campbell  
 Mr. Ralph Cochrane  
 Mr. George T.H. Cooper  
 Dr. Fay Cohen

Mr. J. Dickson Crawford  
 Mr. Fred J. Dickson  
 Mr. H. Lawrence Doane  
 Mr. Peter R. Doig  
 Mr. Fred Fountain  
 Mrs. Linda Fraser  
 Chief Justice T. Alex Hickman  
 Dr. Om P. Kamra  
 Mr. Donald A. Kerr  
 Dr. Patricia Lane  
 Mr. John W. Lindsay  
 Mr. Joseph Loughheed  
 Mrs. Annemarie Macdonald  
 Ms. Bernadette Macdonald  
 Mr. George W. Macdonald  
 Mr. Alex J. MacIntosh  
 Dr. Albro D. MacKeen  
 Mr. Donald Manson  
 The Hon. Jacqueline R. Matheson  
 Mr. Ralph M. Medjuck  
 Sr. Patricia Mullins  
 Mr. Norman H. Newman  
 Chief Judge Ian H.M. Palmeter  
 Ms. Ruth Pulsifer  
 Dr. Cedric E. Ritchie  
 Dr. Judith A. Ritchie  
 Ms. Patricia Roscoe  
 Dr. Donald C.R. Sobey  
 Ms. Maxine N. Tynes  
 Dr. Thomas C. Vinci  
 His Worship Mayor Ronald Wallace (ex officio)  
 Mr. Robert Zed  
 Mr. Sherman Zwicker

**Secretary**

Elizabeth A. Merrick

**Observer for Faculty Association**

Dr. David Williams (President, DFA)

**Senate**

The Senate consists of the President, Vice-Presidents, Deans of faculties and academic department heads, Registrar, full professors, other members of the academic staff elected from and by each faculty, six students elected by students, and certain other persons.

Subject to the general approval of the Senate, faculties are responsible for supervision of programmes of study, of teaching and research, and for the recommendation of candidates for degrees, diplomas, and university prizes.

**Chair of Senate**

Patricia A. Lane, BSc, MSc, PhD

**Vice-Chair of Senate**

Raymond W. Carlson, BA, MSW, PhD

**Secretary of Senate**

Robert N. Berard, BA, BEd, MA, PhD

## 10 Academic Programmes

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### Academic Degrees, and Diplomas

Diploma in Marine Affairs  
1 year  
Diploma in Public Administration  
1 year

#### Master of Arts

1 or 2 years, with thesis in: Classics, Computing Science, Economics, Education, English, French, German, Health Education, History, Leisure Studies, Mathematics, Philosophy, Political Science, Psychology, and Sociology and Social Anthropology

#### Master of Science

1 or 2 years with thesis in: Anatomy, Biochemistry, Biology, Chemistry, Computing Science, Geology, Human Communication Disorders (Audiology or Speech Pathology)(3 years), Kinesiology, Mathematics, Microbiology, Oceanography, Oral and Maxillofacial Surgery (4 years), Pathology, Pharmacology, Pharmacy, Physics, Physiology and Biophysics, Psychology, and Statistics

#### Doctor of Philosophy

2 or 3 years, with thesis in: Anatomy, Biochemistry, Biology, Chemistry, Classics, Economics, Education, English, French, Geology, History, Interdisciplinary Studies, Mathematics, Microbiology, Oceanography, Pharmacology, Pharmacy, Philosophy, Physics, Physiology and Biophysics, Political Science, Psychology, and Statistics

#### Doctor in the Science of Law

1 year, with thesis

#### Master of Arts in Teaching (French)

2 years

#### Master of Business Administration

2 years

#### Master of Business Administration with Bachelor of Laws

4 years

#### Master of Education

1 year

#### Master of Environmental Studies

1 or 2 years

#### Master of Health Services Administration

2 years

#### Master of Laws

1 year

#### Master of Library and Information Studies

2 years

#### Master of Public Administration

2 years

#### Master of Public Administration with Bachelor of Laws

4 years

#### Master of Development Economics

2 years

#### Master of Nursing

2 years

#### Master of Social Work

1 or 2 years

#### Diploma in Aquaculture

1 year

## Special Institutes

A number of special institutes for study and research in specific fields are based at the University. Among these are:

### Atlantic Institute of Biotechnology

Chief Executive Officer: W.E. MacLennan, BScA

The Atlantic Institute of Biotechnology was established in 1985 and received financial support from the Department of Industry, Science and Technology Canada. Its purpose is to assist industry in Atlantic Canada to improve biologically-based processes, and to develop new manufacturing and industrial techniques.

The Institute's main areas of specialization are in the processes of commercialization and the management of research leading directly to commercialization and sourcing of technological information for competitive improvement. The Institute is an intermediary agency for the Canadian Patent Office and offers a broad range of patenting services and advice.

### Atlantic Institute of Criminology

Director: D.M. Clairmont, BA, MA, PhD

The Atlantic Institute of Criminology has been established to provide a centre for research in the areas of criminology, policing, and other concerns of the justice system. In this focus and in its contribution to the associated career development, the Institute is equivalent to those existing in other regions of the country. Scholarships for graduate students in Criminology are available.

Policy for the Atlantic Institute of Criminology is developed with the assistance of an Advisory Board comprising twelve representatives from the academic and professional community of the region.

Associate memberships are available to interested and qualified persons. Workshops and training courses provide opportunities for professional development for employees of the Criminal Justice system in the Atlantic Region.

### Atlantic Region Magnetic Resonance Centre

Director: J.C.T. Kwak, BSc, MSc, PhD.

Manager: D.L. Hooper, BSc, PhD

Established in 1982 with assistance from the Natural Sciences and Engineering Research Council, the Centre is concerned with teaching and research programmes in magnetic resonance. The Centre has modern nuclear magnetic resonance (NMR) and electron spin resonance (ESR) instruments including a 360 MHz Narrow Bore Nicolet NMR instrument and a Bruker MSL 200 NMR for solid state studies.

In addition to providing well-equipped laboratories and instrumentation for resident and

visiting faculty, research scientists and students, the Centre provides NMR spectra and expertise to scientists of eleven universities and research institutes in the Atlantic Region.

### Atlantic Research Centre for Mental Retardation

Director: H.W. Cook, MA, PhD

Established in 1967, the Centre conducts basic biomedical research and population studies in the fields of mental retardation and human genetics. It also provides education in these fields to undergraduate and graduate students and the general public. Special tests and consultative services for the prevention and treatment of diseases causing mental retardation are provided by the Centre. The Centre's professional staff hold appointments in various departments of the Faculty of Medicine. Its work is supported by grants from agencies such as the Medical Research Council of Canada, the Department of National Health and Welfare, the Dalhousie Medical Research Foundation, the governments of the three Maritime provinces, and by private donations.

### Centre for African Studies

Director: J.L. Parpart, MA, PhD

This Centre, established in 1975, coordinates instruction, publication, research and development education programmes in African Studies. Associated faculty hold appointments in departments and units concentrated in the social sciences and humanities. The Centre organises academic and informal seminars and public policy conferences on Africa and encourages interdisciplinary interaction at all levels on African subjects and issues. It offers its own interdisciplinary BA degree and cooperates with the International Development Studies programme and with the Pearson Institute and International Students Centre.

### Centre for Foreign Policy Studies

Director: D. W. Middlemiss, BA, MA, PhD

Established in 1971 with the assistance of a grant from the Donner Canadian Foundation, the Centre is concerned with teaching, research and other professional activities in various aspects of foreign policy and international politics. The work of the Centre is concentrated in the following areas: Canadian Foreign Policy, Maritime and Strategic Studies, and International Political Economy and Developmental Studies. Geographical specializations include Canadian, African, Soviet, European, and American foreign policy.

The Centre is affiliated with the Department of Political Science at Dalhousie University. Centre faculty offer courses in the Department on international relations, foreign and defence policy at both undergraduate and graduate levels. They

## 12 Special Institutes

also supervise masters and doctoral students in these fields.

### Centre for International Business Studies

Director: P.J. Rosson, DipMS, MA, PhD.

The Centre was established in 1975 and is funded by External Affairs and International Trade Canada. Its purposes include the provision of specialist training in international business studies and research in international business. It carries out these functions within the administrative framework of the School of Business Administration.

### Centre for Marine Geology

Director: Paul T. Robinson, BSc, PhD

The Centre for Marine Geology was founded in 1983 to promote the interdisciplinary study of the continental margins and the sea floor. The Centre draws on the faculty and resources of the Departments of Geology, Oceanography and Physics and others. The objectives of the Centre are: (1) to expand the university's leading role in international studies of the oceanic crust, (2) to participate with industry and government in the geological aspects of oil and gas development on Canada's east coast and (3) to continue research on sedimentation and the recent history of the Canadian offshore.

### Dalhousie Health Law Institute

Director: Robert G. Elgie, QC, BA, MD, FRCS(C)

The Health Law Institute is an interdisciplinary Institute which conducts and coordinates research and teaching in the Faculties of Law and Medicine, and in Dentistry and Health Professions as well. Supported by the Donner Canadian Foundation and the Law Foundation of Nova Scotia, the Director and his Faculty Associate are cross-appointed to the Faculties of Law and Medicine. They work with an advisory board and with colleagues in those and other Faculties on grant and contract funded research, teach and coordinate the teaching of law as it applies in the broad field of health to students in Dentistry, Health Professions, Law and Medicine, supervise graduate students and conduct continuing education courses for health professionals on a contract basis. The initial focus of the Health Law Institute is on aspects of health law of particular relevance to aging.

### Lester Pearson Institute for International Development

Executive Director: A. Tillett, BA, MA

LPI was founded in 1985 to promote Dalhousie's involvement in international development activities. In mid-1987, the Institute was merged with the Centre for Development Projects and, at the same time, was given

responsibility for oversight of all externally financed development programmes and projects at Dalhousie. In addition to its administrative functions in the university, the major activities of the Institute include development education activities for the community, a lecture and seminar series, conferences, research, and input to public policy on Canada's role in international development. The Institute does not participate directly in academic degree programmes but does seek to advance such programmes in the field of international development and hosts the Lester B. Pearson University Chair in Development Studies. The Institute may directly undertake non-degree training activities and operate and manage international development projects.

### Neuroscience Institute

Interim Director: I.A. Meinertzhagen, BSc, PhD

The Neuroscience Institute was founded in 1990 to promote and coordinate research in neuroscience, the modern interdisciplinary study of the brain and nervous systems. The development of the Institute parallels the establishment of many such institutes throughout the world and marks dramatic recent progress in understanding the workings of the brain, as signalled for example by U.S. President Bush's declaration of the 1990's as the Decade of the Brain.

Currently housed in the Life Sciences Centre, the Institute serves as an umbrella organization to foster research and training in neuroscience at Dalhousie. A major objective is to increase understanding of the functions of the nervous system in health and disease and, to this end, the Institute coordinates the activities of neuroscientists in the Faculty of Medicine and of Science, facilitating collaboration between clinical and basic scientists in the two Faculties. Some foci of current research activity include: the autonomic nervous system; development and plasticity of the nervous system; and, sensory physiology. The Institute also provides a vehicle to seek new sources of funding, and will encourage new initiatives in all areas of neuroscience research at Dalhousie. In addition, the Institute promotes and coordinates training programmes in neuroscience currently offered through constituent departments at both the undergraduate and graduate levels. Associated with the latter it will sponsor a seminar series annually.

### Oceans Institute of Canada/Institut canadien des océans

Executive Director: Judith Swan, BA, LLB, LL.M

Associate Director: Cynthia Lamson, BA, MS, MA, MBS

The Oceans Institute of Canada/Institut canadien des océans is a federally incorporated, not-for-profit organization. The Institute, formerly the International Institute for Transportation and

Ocean Policy Studies (ITOPS), represents the amalgamation of two university-based centres devoted to ocean and marine studies, the Dalhousie Oceans Studies Programme (DOSP) and the Canadian Marine Transportation Centre (CMTC).

While the Oceans Institute is independent, it maintains an affiliation with Dalhousie University, and works cooperatively with several schools and institutes including the Law School, School for Resource and Environmental Studies, the School of Business Administration, the Marine Affairs Programme, and the Centre for Foreign Policy Studies.

The Institute is strategically located in Halifax, the centre of oceans excellence in Canada but the network of Associates from all regions of the country and around the globe make the Institute a truly national and international organization.

### Trace Analysis Research Centre

Director: L. Ramaley, BA, MA, PhD

With the assistance of a grant from the National Research Council, the Centre was established in 1971 to train analytical chemists and, through research, to contribute to the advancement of analytical chemistry. A major facility of the Centre is a low-power nuclear reactor (SLOWPOKE) which is available to researchers within Dalhousie and elsewhere.

## Resources and Services

### Advisory Committee on Sexual Harassment

Sexual harassment takes many forms, from constant joking to physical assault. It may involve implicit or explicit threats to a student's grades or employment. It may make the study or work environment uncomfortable through continued sexual comments, suggestions, or pressures. Dalhousie University is committed to an environment free of sexual harassment, if a student feels she or he may be involved in a situation of sexual harassment, they are encouraged to discuss questions and concerns with a member of the Sexual Harassment Advisory Committee. All discussions are confidential, and advice and information is available about informal methods of dealing with a sexual harassment problem. The Committee can be reached through the Sexual Harassment Information Line, 494-1659.

### Advisor on Women

Dalhousie's Advisor on Women assists in the development of policies and practices designed to eliminate barriers to and bias against women. Her mandate includes policy development and research, and she is involved in university committees focusing on issues concerning women. She works with administration, faculty, staff, and students on a variety of issues and is available as a resource person to groups and individuals on campus.

### Alumni Association

The Alumni Association is composed of over 56,000 former students and coordinates a number of programmes including homecomings, reunions, branch meetings, sports events, information lectures, a tutoring service, a Student Leadership Conference, Scholarships and Bursaries, and the Alumni Award for Teaching Excellence and the Outstanding Alumnus Award. The Association publishes the Dalhousie Alumni Magazine which is sent to all alumni and friends.

The alumni play a vital role in the University in a wide variety of ways including representation on the Board of Governors.

### Athletics

Athletics and Recreational Services offers a wide range of programmes for every Dalhousie student. More than fifty clubs and intramural programmes offer fun, fitness and companionship while 13 varsity sports provide excitement for players and spectators alike. For those who prefer less competitive activities, there is a great number of fitness, leisure and aquatic instructional programmes.

## Bookstore

The University Bookstore, owned and operated by Dalhousie, is a service and resource centre for the university community and the general public. The Bookstore has all required and recommended texts, reference books and supplies, as well as workbooks, self help manuals and other reference material. The general book (trade) department has on of the largest selections in the city, including classics, bestsellers, new releases, and books by Dalhousie authors.

The Health Sciences department has the largest and most complete medical book section in Atlantic Canada, with over 2000 titles in stock. Thousands of other titles are specifically ordered annually, and the department ships out books to medical personnel and hospitals throughout the region.

The Stationery department carries all necessary and supplementary stationery and supplies, including scientific and engineering items. The Campus shop carries gift items, mugs, clothing and created wear, cards, jewellery, posters, class rings, backpacks, novelties, briefcases, and general University paraphernalia. A Special Order department is available to students and is located in the office area.

The Bookstore is situated on the lower level of the Student Union Building on University Avenue, and is open year round, Monday to Friday.

## Canada Employment Centre on Campus

The main function of the Employment Centre is to aid Dalhousie students in their efforts to obtain permanent, summer, or part-time employment. It is located on the fourth floor of the Student Union Building, and operates Monday through Friday from 8:00 am to 4:30 pm, 494-3537.

The Employment Centre also has useful information on resume preparation, interview techniques, and job-search skills.

Interviews for graduating students are arranged with over 80 employers who visit Dalhousie each year (mid-October to mid-November are usually the busiest months).

Summer employment listings are received as early as November, while new part-time jobs are posted daily for both "on campus" and "off campus" locations.

Students are encouraged to visit the Employment Centre on a weekly basis throughout the school year for any type of employment assistance.

## Chaplaincy at Dalhousie

The University provides facilities for chaplains appointed by various churches. There are five chaplains at Dalhousie, representing the Anglican, Baptist, Roman Catholic, Lutheran, and United Church traditions. In addition, contact ministers are designated by the Jewish, and

Presbyterian traditions and can be reached through the Chaplains' Office on campus. The Chaplains' Office is located on the third floor of the Student Union Building, telephone 494-2287. Office hours are Monday to Friday 9 - 4. Appointments can be made for other convenient times. The chaplains are available at any time for emergencies. Outside office hours, chaplains may be reached by calling the SUB Enquiry Desk 494-2140.

## Computing and Information Services

University Computing and Information Services provides graduate students with mainframe and microcomputer facilities and services. Authorization to use the facilities must be arranged through course instructors or a student's thesis advisor. Mainframe computing is provided by a Digital Equipment Corporation VAX 8800 (VMS operating system). Terminal and microcomputer labs are located in the Computer Centre, the School of Business, and Carleton Campus. Students with a terminal or microcomputer at home can access the mainframe by telephone.

### Computer Centre

The Computer Centre, in the basement of the Killam Library, houses labs that provide terminals, IBM-PC compatible and Apple Macintosh microcomputers for general student access. It is also the location of the offices of Academic Computing Services, Facilities and Operations, and Communications Services. Personal Computer Information Centre

The Personal Computer Information Centre, in the basement of the Killam Library, provides assistance in the evaluation and selection of microcomputer hardware and software. Demonstration machines and programmes are on display from time to time.

### School of Business

The School of Business lab is equipped with terminals and IBM-PC compatible microcomputers. These may be used to access several MicroVAX microcomputers used by the School of Business or the VAX 8800 mainframe. The MicroVAX can also be accessed by telephone.

### Carleton Campus

The Carleton Campus Computer Laboratory, in Dentistry room 2602, is equipped with IBM-PC compatible and Apple Macintosh microcomputers. These may also be used to access the VAX 8800 mainframe.

### Consulting

Assistance is available at each lab from both student assistants and full time staff of Academic Computing Services. The student assistants provide assistance with common problems with the operating systems, editors, and frequently used languages and packages. Staff may provide further assistance to faculty, staff, and thesis students.

### **Non-credit Courses**

Students should plan ahead to be sure they know how to make use of the facilities available to them. Academic Computing Services, in conjunction with Henson College, offers a series of non-credit courses. Topics include the use of the mainframe and microcomputers programmes for word processing and statistical analysis; skills useful during thesis preparation. Interested students should investigate these at the beginning of term.

### **Counselling and Psychological Services**

The Counselling and Psychological Services Centre offers programmes for personal, career and educational concerns. Counselling is provided by professionally trained, Counsellors and Psychologists. Strict confidentiality is ensured. Counselling is available both individually and on a group basis. Topics covered by regularly offered group programmes include Study Skills, Career Decision Making, Exam Anxiety Reduction, Public Speaking Anxiety Reduction, Assertiveness, People Skills, Resume Writing and Job Search Skills. Information on a wide variety of careers and academic programmes is available in the Frank G. Lawson Career Information Centre. Students wishing to get a first hand view of careers they are considering entering, may contact alumni willing to discuss their career experiences through the Centre's Mentors and Models programme. Interest testing is also available to students. In addition, those individuals who have been out of school for a period of time is available on a fee for service basis.

The Counselling and Psychological Services offices and its Frank G. Lawson Career Information Centre are located on the 4th Floor of the Student Union Building. Inquire or make appointments by dropping in or calling 494-2081.

### **Dalhousie Arts Centre**

The region's major performing arts theatre and the highly regarded Dalhousie Art Gallery, housed in the Dalhousie Arts Centre, are active places indeed.

The 1,041 seat Rebecca Cohn Auditorium presents a wide variety of programmes ranging from ballet to rock, classical music to children's performances.

The Dalhousie Art Gallery offers the public access to national and international touring exhibitions and initiates many ambitious and exciting exhibition programmes.

### **Dalhousie Student Union**

Every Dalhousie student is automatically a member of the Dalhousie Student Union. The Student Union is recognized by an agreement with the University Administration and by an Act of the Nova Scotia legislature as the single voice of Dalhousie students. All student activities on campus are organized through the Student Union,

and the Student Union is the focus of all student representation. The business of the Student Union is conducted by a Council made up of 40 members. Every student is represented by one or more representatives of their faculty, elected within their faculty in the spring. As well, students who live in residence and international students also elect their own representatives because they are uniquely affected by certain university policies. Also on the Council are the student representatives elected to the Senate and Board of Governors.

One of the most important resources of the Student Union is the Student Union Building located on University Avenue between Seymour and LeMarchant Streets. The SUB, which is exclusively operated by the Student Union and is paid for through Student Union fees, was opened in 1968 as a centre for student activity on campus. Every student has the opportunity to take advantage of the Union's financial, physical and organizational resources. To use that opportunity you should know who represents you on Council and who are the members of the Executive. The Student Council office is located on the second floor of the SUB and is open from 8:30 a.m. to 4:30 p.m. Monday through Friday, phone number 494-1106. Council members have mail boxes located in that office. Union Executive officers also have offices in the SUB.

### **Housing/Residence Services**

For the 55 per cent of Dalhousie University students whose homes are outside the Halifax Metropolitan area, where to live while attending university is a major question. The supply of University owned housing does not meet the demand and the vacancy rate in the various private, commercial units is very low. It is therefore very important that students planning to attend Dalhousie think well in advance about their accommodation needs. It is fair to say two things about housing for Dalhousie students: first, early application for University residence is essential and second, students seeking off-campus housing should also begin to investigate that process well in advance of the beginning of term.

The traditional style residences at Dalhousie are chiefly for undergraduate students; very few graduate spaces are allocated and in many cases students pursuing advanced degrees are not prepared to live with the exuberance of first and second year students.

The information below gives a description of A. traditional on-campus residences, B. off-campus housing owned by the university and C. the services offered by the off-campus housing office listing service. In each case the name of the person responsible is listed and telephone number provided. For information on housing fees, the Fees section of the Calendar.



**Please Note:** Academic acceptance by the University, i.e., admission to a course of study, **DOES NOT IN ANY WAY GUARANTEE** admission to University Housing or provision of off-campus accommodation.

It is the responsibility of the individual student in all cases to make separate application for the university housing of her/his choice, or to avail him/herself of the listing services provided by the Off-Campus Housing Office.

Early application for university residences and housing is strongly recommended. Applications will be received commencing January 1. Students are encouraged to complete their applications before March 1.

#### A. Traditional Style On Campus Residence Howe Hall

The centrally located men's residence on campus, Howe Hall, provides accommodation for 520 undergraduate students. The sprawling, grey ironstone complex is divided into five houses: Henderson, Smith, Bronson, Cameron and Studley. Each house has its own distinctive identity and student government. The ratio of seniors to first-year students is approximately 50/50, except in Henderson house which is predominantly for freshmen. Howe Hall is the only on-campus residence option for male students in their first year.

The houses offer both double and single rooms with the singles generally reserved for senior undergraduates and the doubles for first-year students. Facilities included two dining rooms, lounges, television rooms in each house, a canteen, games room, squash courts, weight room, study areas and laundry room.

Howe Hall is accessible to handicapped students.

#### Shirreff Hall

The largest women's residence on the Dalhousie campus, providing accommodation for 445 female students, is Shirreff Hall. Located in a quiet corner of the campus, it is minutes from classes, the library, Dalplex and other facilities as well as from the scenic Northwest Arm. It is divided into four sections - Old Eddy and New Eddy, with predominantly double rooms for first-year students, and Newcombe and the Annex, with single rooms reserved for senior students.

Shirreff Hall offers a dining room, an elegant library and visitors' lounge, study hall, study area, games room, television lounges, exercise room, kitchenettes, canteen, laundry room and reception desk. Students have access to two pianos and a tennis court on the grounds.

#### Eliza Ritchie Hall

Opened in 1987, Eliza Ritchie Hall is the University's newest women's residence. It provides traditional residence accommodation for 84 female students in predominantly single rooms.

The three-storey building of powder blue clapboard is located close to the Dalplex and to Shirreff Hall, where students take their meals. Facilities include study rooms, a multipurpose room, reception area, laundry facilities and leisure lounges with kitchenettes.

#### B. Off Campus, University Owned Housing Fenwick Place

Dalhousie's 33-storey Fenwick Place offers students the privacy and some of the independence of apartment living. Located in Halifax's south end, it is only a 15-minute walk or a short bus ride from the campus. Because Fenwick houses both single and married students, the mix of people provides a harmonious living environment.

Many of the 252 apartments in Fenwick Place are furnished to accommodate students in groups of two, three or four. Priority is given to students who apply in groups and who are currently living in a Dalhousie residence. Each of these apartments has a full kitchen and bathroom, furnished living room and dining area and a balcony. Bedrooms have desks and a mate-style bed. Heat, hot water, electricity and cable television are included in the residence fee.

Fenwick also has a number of unfurnished bachelor, one and two-bedroom apartments which are rented to married and single students. Each of these apartments has a full kitchen and bathroom. Heat, hot water and cable television are included in the rent.

Laundry facilities are available on every floor of Fenwick Place. The front desk is open 24 hours a day with staff available to provide security, information and advice to students. Fenwick is also totally accessible to handicapped students.

#### Glengary Apartments

Located close to the campus on Edward Street, Glengary Apartments is a four-storey brick building offering accommodation to 52 female students. Preference is given to students in second and third year and especially to those who apply in groups of four.

Glengary has 12 furnished apartments, each with space for four women. The apartments feature two single rooms, double room, kitchen, living room and bathroom. There are also four bachelor apartments which are always in high demand. Laundry facilities are located in the basement, where there is also a limited amount of storage space.

Coordinators are available for security and administrative services and also act as a resource for students who may need advice or assistance.

#### Co-ed Apartment Units

Dalhousie has two co-ed apartment buildings which are open to students in graduate programmes. Located on University Avenue, close

to the main campus, the building includes bachelor, one and two-bedroom apartments and accommodates a total of 25 students.

Each apartment has a living area and kitchen facilities with a fridge, stove and sink, a full bathroom and ample cupboard space but is otherwise unfurnished. A laundromat is located in the neighbourhood. Heat and hot water are included in the rent.

### Residence Houses

Dalhousie also has 14 residence houses, all of which were once single family homes, with their own kitchens, living rooms and bathrooms. The character of these homes has been maintained as much as possible. The houses are all on campus. Although they are generally occupied by female students in graduate programmes or professional schools, a few of the 100 spaces are reserved for undergraduates.

One of the houses is designated as a 24-hour quiet area for students who want a particularly quiet environment in which to live and study. Two of the houses are French houses, reserved for male and female students who would like to live in a French-speaking environment. A fourth house is set aside for the President's Leadership Class and is occupied by a group of ten male and female students in their first year of study. The students are selected by the President's Leadership Committee for their commitment to develop a service ethic and benefit from a cooperative living experience.

All of these houses have both single and double rooms, each with a bed, dresser, study desk, lamp and chair. Linen, cooking utensils and small appliances are not provided. Students share kitchen and living room areas which are maintained by the cleaning staff. A trained senior student acts as a house coordinator and liaison with the Dean of Women to provide administrative and resident-related services.

### International Student Houses

Dalhousie reserves two special houses for international students arriving in Canada for their first year of study. Located close to the main campus, these houses consist mainly of single rooms with shared bathroom and kitchen areas. Rooms are furnished with a bed, desk, drapes and a chair as well as linen. Although cooking facilities are provided, utensils are not.

### Living Off-Campus

Dalhousie's Off-Campus Housing Office assists students who do not want to live on campus or who have been unable to find a place in residence or in University apartments and houses. Located in the Student Union Building, this office is designed to help students find privately-owned accommodation.

The Off-Campus Housing Office provides centralized information on available housing in the

Halifax metro area, including apartments, rooms, condos and houses. Up-to-date computerized printouts of these listings are available as well as telephones for calling landlords and material such as maps and transit schedules.

Although the housing staff cannot arrange, inspect or guarantee housing, they will do everything they can to help students find accommodation that is pleasant, inexpensive and close to campus.

Because of the low vacancy rate in Halifax, it is advised that students start looking for off-campus housing well ahead of the academic year.

### General Information

- Application forms must be accompanied by an application fee and a deposit in Canadian funds, payable to Dalhousie University. Deposit amounts are listed on the application form.
- Applications to residence may be submitted prior to acceptance to the University for a course of study.
- Acceptance into an academic programme does not mean that application for a place in residence has been approved or vice versa.
- To live in any of the University-owned buildings, students must maintain full-time status at Dalhousie throughout the academic year.

For further information on living at Dalhousie, or for additional copies of the residence application form, do not hesitate to contact:

Director of Housing and Conferences  
Room 122, Student Union Building  
Dalhousie University  
Halifax, N.S. B3H 4J2  
(902) 494-3365

Dean of Women  
Shirreff Hall Women's Residence  
Dalhousie University  
6385 South Street  
Halifax, N.S. B3H 4J4  
(902) 494-2577

Dean of Men  
Howe Hall Men's Residence  
Dalhousie University  
6230 Coburg Road  
Halifax, N.S. B3H 4J5  
(902) 494-1054

Manager  
Fenwick Place  
Dalhousie University  
5599 Fenwick Street  
Halifax, N.S. B3H 1R2  
(902) 494-2075

## Health Services

The university operates an out-patient service, in Howe Hall, at Coburg Road and LeMarchant Street staffed by general practitioners and a psychiatrist. Further specialists' services are available in local hospitals and will be arranged through the Health Service when indicated. All information gained about a student by the Health Service is confidential and may not be released to anyone without signed permission by the student.

Appointments are made during the clinic's open hours, from 9 a.m. to 10 p.m. In the event of emergency, students should telephone the University Health Service at 494-2171 or appear at the clinic in person. The university maintains health services on a 24-hour basis with a physician on call.

All students must have medical and hospital coverage approved by the Health Service. All Nova Scotia students are covered by the Nova Scotia Medical Services Insurance. All other Canadian students must maintain coverage from their home provinces. This is especially important for residents of any province requiring payment of premiums. All non-Canadian students must be covered by medical and hospital insurance prior to registration. Details of suitable insurance may be obtained from the University Health Service prior to registration. Any student who has had a serious illness within the last 12 months, or who has any chronic medical condition, should contact and advise the Health Service, preferably with a statement from the doctor.

The cost of any medication prescribed by a physician is recoverable under a prepaid drug plan administered by the Student Union.

## Instructional Development and Technology

At Dalhousie, the responsibility for co-ordinating distance education falls under the mandate of the Office of Instructional Development and Technology (located at the entrance to the Killam Library, telephone 494-1622). Working in cooperation with those departments which offer courses at a distance the office is responsible for:

- professional support in developing and planning of course offerings
- advice in the design, production, and presentation of quality instructional materials.

The University recognizes the importance of distance education as one way of discharging its responsibilities to the region, particularly in fields (for example, the Health Professions) where its programmes are unique. Distance education is especially popular with busy professionals who might not otherwise have the opportunity to upgrade their university education.

To date distance education courses have been concentrated in the Faculty of Health Professions, eg. Nursing, Physiotherapy, Occupational Therapy, Social Work. However, such courses are also

available from some other departments including the School of Public Administration. Students interested in taking distance education courses from these schools should contact them directly. General enquiries should be directed to the Registrar's Office.

## International Student Centre

The International Student Centre provides services and programmes for Dalhousie's students from around the world. It is a resource and activity post for international students, and is dedicated to ensuring that international students make the most of their stay in Canada.

The Centre provides information and advice on financial, legal, immigration, employment and personal matters and acts as a referral point to other services on campus. It organizes reception and orientation programmes that assist international students in adjusting to the new culture and in achieving their educational and personal goals. A variety of social, cultural and educational programmes are also held throughout the year. The Centre coordinates activities that facilitate fostering of relationships with the university and city communities.

The Centre has a lounge where students can meet and a reading room where students can study or read international publications. For further information, contact: The Advisor, International Student Centre, Dalhousie University, Halifax, N.S., Canada, B3H 3H6 or phone (902) 494-7077.

## Laboratories

Laboratories are well equipped for a wide variety of research in the sciences and medical sciences. The Sir James Dunn Science Building houses the laboratories for the Departments of Engineering, Geology, and Physics, while the Chemistry Building contains the research areas for the Department of Chemistry.

Medical science facilities are located in the Sir Charles Tupper Medical complex. The Sir Charles Tupper Medical Building houses the Departments of Anatomy, Biochemistry, Microbiology, Pathology, Physiology, and Pharmacology. The Animal Care Centre is also located in the Tupper Building. The Clinical Research Centre, which is connected by a link to the Tupper Tower, houses the research laboratories for the Departments of Medicine, Obstetrics, Paediatrics, Preventive Medicine, and Family Practice Teaching Unit. The Atlantic Research Centre for Mental Retardation is situated in the link area between the Clinical Research Centre and the Tupper Building.

In close association with these are a number of affiliated institutions and teaching hospitals for medical training.

The George A. Burbidge Pharmacy Building is equipped with modern research and teaching laboratories to accommodate programmes in

pharmaceutical research.

Facilities are available for research in Microbiology and Pathology in the Pathology Institute of the Nova Scotia Department of Health. Excellent equipment for advanced research has been established in this centre.

Research facilities for the Departments of Biology, Psychology, and Oceanography are located in the Life Sciences Building. The Psychology Laboratories are equipped for research in all major areas of Psychology. Excellent facilities, including a laboratory nursery school, are available for research with children, and arrangements exist for clinical research in Camp Hill Hospital and the Nova Scotia Hospital.

The Oceanography Department, in cooperation with the Departments of Biology, Chemistry, Geology, and Physics, works closely with the Atlantic Oceanographic Group and the Bedford Institute to provide a powerful institutional group for study of the oceans. Ocean-going research vessels are in active use, particularly in the summer months, providing sea time as an integral part of the student's academic programme.

The University also maintains close contacts with the Atlantic Regional Laboratory of the National Research Council, the Defense Research Establishment (Atlantic), the Fisheries Experimental Station (Atlantic), and the Nova Scotia Research Foundation. Dalhousie faculty members, postdoctoral fellows and graduate students make active use of the research facilities of these cooperating institutions.

The language laboratories for the Departments of French, Spanish, German, and Russian are housed in the Killam Library.

## Libraries

The Dalhousie University Library system is organized to accommodate the needs of the undergraduate teaching programmes, graduate and faculty research projects, and professional schools. The libraries in the system are University Library (Killam - Humanities and Social Science; and the Macdonald - Sciences, Mathematics), Sir James Dunn Law Library, Kellogg Health Sciences Library.

Although these libraries have specific responsibilities, the resources and services of all are available to the whole University community as well as to many other groups within the Atlantic Provinces.

### University Library

The University Library has a collection of over 600,000 monographs and bound serials which support the Arts & Science programmes, a periodical collection of more than 5,900 current subscriptions, and a government document and report collection of approximately 200,000 items. This last is particularly strong in Canadian and UN material. In addition to traditional printed materials, the library is developing its resources in

forms such as records, scores, and microforms. These central resources are supplemented by small departmental working collections as required.

### Special Collections

Dalhousie University Library has a number of excellent special collections providing support for research programmes. These include the J.J. Stewart Canadiana Collection, the William Inglis Morse Collection of rare maps, bindings, and early printed books, the Bacon Collection, the Sprott Modern Australian Literature Collection, and the James MacGregor Stewart Kipling Collection, one of the finest in the world. Also of significance are the McCulloch Collection of mineral and fossil specimens and the Honeyman Collection of geological specimens.

### Killam Memorial Library

Opened in 1970, the Killam Memorial Library has a number of specialized features. These include faculty offices, seminar rooms, and 400 student carrels. These carrels are wired for eventual installation of on-line computer connections and closed circuit television. This library offers a variety of audio-visual units and ancillary services (typing rooms, computer services, language laboratories, microfilm equipment) as well as an auditorium and display and exhibition areas.

### Law Library

The Law Library, with resources exceeding 145,000 volumes and over 750 current legal periodical subscriptions, provides a virtually complete collection of common law materials, a very good collection of international law materials, and a fast-growing marine and environmental law section. It also has a small working collection of foreign law, in particular French law.

### Halifax Libraries

Dalhousie is fortunate in being able to use the resources of libraries in the Halifax area. Chief among these for research interests are King's College Library with its incunabula; Dalhousie Institute of Public Affairs with its specialized collection in community planning; the Public Archives of Nova Scotia, which includes the Akins' Library, a collection of more than 4,000 volumes on colonial and Canadian history; the Provincial Legislative Library; the libraries of the Nova Scotia Research Foundation, the Bedford Institute, the Technical University of Nova Scotia, Saint Mary's University, Mount St. Vincent University, the Maritime School of Social Work, and the Nova Scotia College of Art and Design.

### Ombud's Office

The Dalhousie Ombud's Office offers assistance and advice to students facing university-related financial or academic problems. The Ombud's Office can help students resolve particular grievances and also attempts to ensure that existing policies are fair and equitable.

Jointly funded by the University and the Dalhousie Student Union, the Ombud can provide information and direction to students on any University-related complaint.

The Dalhousie Ombud's Office is located in the Student Union Building, Room 403. Telephone No. 494-6583.

### Registrar's Office

The office is responsible for high school liaison, admissions, awards and financial aid, registration, maintenance of student records, scheduling and coordinating formal examinations, and convocation. Of greater significance to students, however, is the role played by members of the staff who provide information, advice, and assistance. They offer advice on admissions, academic regulations and appeals, and the selection of programmes. In addition, they are prepared to help students who are not quite sure what sort of assistance they are looking for, referring them as appropriate to departments for advice about specific major and honours programmes or to the office of Student Services or to specific service areas such as the Counselling Services Centre.

Among the staff are people with expertise in financial aid and budgeting who are available for consultation.

The summer advising programme for first year students in Arts and Social Sciences, Management, Engineering and Science is directed from the Registrar's Office. Prospective students may arrange a tour of the campus through this office.

The fact that the Registrar's Office is in contact with every student and every department means that it is ideally placed to provide or to guide students and prospective students to the source of the advice or assistance they need.

### Student Advocacy Service

The Student Advocacy Service was established by the Dalhousie Student Union and is composed of qualified students from the University. The main purpose of the Service is to ensure that the student receive the proper information when dealing with the various administrative boards and faculties at Dalhousie. An Advocate may also be assigned to assist students with appeals or in a disciplinary hearing for an academic offence. Our goal is to make the often unpleasant experience of challenging or begin challenged by the University less intimidating.

The Advocates may be contacted through:  
Student Advocacy Service  
Room 404  
Dalhousie Student Union Building  
Telephone: (902) 494-2205

### Student Clubs and Organizations

Students seeking information on clubs and societies should call the GET INVOLVED LINE 494-3527.

Extracurricular activities and organizations at Dalhousie are as varied as the students who take part in them.

Organizations range from small informal groups to large well organized ones; they can be residence-based, within faculties, or university-wide.

Some are decades old with long traditions, others arise and disappear as students' interests change.

The Student Handbook publishes a list of clubs, societies and organizations, and every fall new students are encouraged to select and participate.

### Student Services

Located in Room 410 of the Student Union Building, this office provides a point of referral for any student concerns. The Vice-President is the chief Student Services officer and coordinates the activities of Athletics and Recreational Services, Black Student Advising, Student Counselling and Psychological Services, Chaplaincy, Disabled Student Advising, Health Services, Housing and Conferences, Office of the Registrar, Writing Resource Centre, International Student Centre, and the Ombud Office. Students who experience difficulties with their academic programmes or who are uncertain about educational goals, major selection, workload management, social or personal matters affecting their academic performance, inadequate study skills, or conflicts with faculty and regulations can seek the assistance of the Academic Advisors in the Vice-President's office.

### Writing Workshop

The Writing Workshop programme recognizes that students in all disciplines are required to write clearly to inform, persuade, or instruct an audience in term papers, laboratory reports, essay examinations, critical reviews and more. This English language resource centre offers classes in language and writing, a tutorial service, guidelines for acceptable standard language usage, and provides information about sources for reference. For more information about the Writing Workshop, please call 494-3379.

## FEES 1991 - 1992

### Student Accounts Office

The Student Accounts Office is located on the basement level of the Arts & Administration building.

**Address:** Dalhousie University  
Student Accounts (Financial Services)

Room 29  
Arts & Administration Building  
Halifax, Nova Scotia  
B3H 4H6  
Tel (902) 494-3998  
Fax (902) 494-1534

#### Office Hours

8:30 - 4:30 Monday to Friday  
(or by appointment)

**NOTE:** All the regulations in this section may not apply to Graduate Students. Please refer to the "Faculty of Graduate Studies" section of the Graduate Studies Calendar.

This section of the Calendar outlines the University Regulations on academic fees for both full-time and part-time students enrolled in programmes of study during the fall and winter sessions. A section on University residence and housing fees is also included. Students wishing to register for the Spring or Summer session should consult the Summer School Calendar for information on registration dates and fees. Should you have any questions regarding these regulations or on the payment of fees generally, please contact the Student Accounts Office.

All fees are subject to change by approval of the Board of Governors of Dalhousie University. An Academic Fee Schedule will be available in March. A list of miscellaneous fees is included in Appendix II on page 25.

Students should make special note of the registration deadlines contained in the calendar on pages 5 and 6. Students should also be aware that additional fees and/or interest will be charged when deadlines for payment of fees as contained herein are not met.

For the convenience of students, registration material and non-cash payments are accepted by mail. Registrations with cheques postdated to September 6, 1991 will also be accepted. Please allow sufficient time to ensure that material sent by mail is received on or before the specified dates. Please note that after August 23rd we are unable to retrieve post-dated cheques.

### General Regulations

The following general regulations are applicable to all payments made to the University in respect of fees.

\* Fees must be made in Canadian funds by

cash or negotiable cheque.

\* If payment is by cheque and returned by the bank as non negotiable, there will be an additional fee of \$15.00 and the account will be considered unpaid. Furthermore, if the bank returns a cheque that was to cover the first payment of tuition, the student's registration will be cancelled and, if permitted to re-register, a late fee will apply.

\* Bills for fees will not be issued. The receipt obtained from Student Accounts each time a payment is made will show the date and amount of the payment as well as the balance outstanding.

### Admission Deposit

A deposit of \$100.00 is required by all new students in Specified Limited Enrollment Programmes (except in Law where the required deposit is \$200.00) within three weeks of receiving an offer of a place at Dalhousie. (Please refer to Appendix I on page 25 for the definition of Specified Limited Enrollment Programmes.) Further information on the regulations governing the refund of admission deposits is contained in the section below on Changes, Refunds and Withdrawals.

### Foreign Students

Students registering at Dalhousie University who are not Canadian citizens or permanent residents are required to pay an additional fee referred to as a "Differential Fee" in the amount of \$1700.00. There is a proportionate charge for part-time foreign students. The payment of the differential fee is payable with the first installment of fees each year.

### Academic Fees

Academic fees are comprised of: (a) the University fee for tuition; and (b) an incidental fee comprised of Student Union, and Society fees. Table 1 contains the academic fees approved for the 1991/92 academic year.

Students registered in two degree programmes are required to pay separate academic fees for both programmes.

### Registration

The final step in registration is the payment of fees. A student is considered registered only after financial arrangements have been made with Student Accounts.

#### All students:

- must submit to the Student Accounts Office on or before the specified registration dates the first installment of academic fees unless they are receiving a scholarship, fellowship, Canada Student Loan, a fee waiver, or their fees are paid by external organizations;
- those holding external scholarships or awards paid by or through Dalhousie University

- must provide at registration documentary evidence of the scholarship or award;
- those whose fees are to be paid by a government or other agency must provide a signed statement from the organization at registration;
- those whose fees are to be paid by Canada Student Loan must indicate as such on the appropriate section of the registration form. (Please note: Students registering by Canada Student Loan must negotiate the Loan or provide the letter of declination issued by Student Aid by September 23. In any event, a reinstatement fee and/or interest may be charged after September 23. Failure to comply or arrange an alternative method of payment may result in deregistration).
- those whose fees are paid by a Dalhousie University staff tuition fee waiver must present the approved waiver form and pay the Student Union, and Society Fee at registration.

The completion of the registration process shall be deemed to be an agreement by the student for the payment of the balance of fees unless written notification to withdraw is submitted in writing at the Office of the Registrar. Students withdrawing in person must attend the Office of the Registrar and the Student Accounts Office before the withdrawal process is official. Graduate and Professional students wishing to withdraw should initiate formal action to withdraw at the Office of the Dean of Graduate Studies.

### Payment of Academic Fees

An Academic Fee Schedule for 1991/92 will be available in March.

The payment of academic fees will be received at the Student Accounts Office located on the basement level of the Arts & Administration building.

Fees paid by mail must be received by Student Accounts on or before the deadlines specified below in order to avoid late payment and/or delinquency charges.

The following regulations apply to the payment of academic fees. For further information on regulations regarding withdrawal of registration, please refer to the Changes, Refunds and Withdrawals section below.

- i) Should students prefer to pay in two installments, the first installment is due on or before September 6 and the second installment is due January 31.
- ii) Students registering for either the fall or winter terms only must pay fees on or before September 6 and January 6, respectively.
- iii) Scholarships or awards paid by or through Dalhousie University will be applied to tuition and residence fees in that order.
- iv) When Canada Student Loan or co-payable bursary is presented at the Student Accounts

- v) Office, any unpaid academic, residence fees and/or Temporary Loans will be deducted.
- v) Fees cannot be deducted from salaries paid to students who are employed at Dalhousie University.
- vi) Regrettably, subsequent to August 23, 1991 we are unable to retrieve post-dated cheques.
- vii) Any payments received will first be applied to overdue accounts.

### Late Registration

Students are expected to register on or before the specified registration dates. Students wishing to register after these dates must receive the approval of the Dean of Graduate Studies and pay a late registration fee of \$50.00. This fee is payable at the time of registration and will be in addition to the first installment of fees.

### Changes, Refunds and Withdrawals

Please consult Student Accounts for all Financial charges and the Office of the Registrar for Academic regulations.

A refund of fees will not be granted unless the following conditions are met.

### NON-ATTENDANCE AT CLASSES DOES NOT CONSTITUTE WITHDRAWAL.

- i) Written notification of withdrawal must be submitted to the Office of the Registrar.
- ii) After the approval of the Registrar has been obtained, (in the case of graduate and professional school, the appropriate Dean) application for a refund or adjustment of fees should be requested from the Student Accounts Office immediately. For students withdrawing in person the withdrawal process is official on the date that application for withdrawal is made at the Student Accounts Office. Therefore, the calculation of the refundable portion of fees will be based on this date. (Retroactive withdrawals will not be permitted.)
- iii) No refunds will be made for 30 days when payment has been made by personal cheque.
- iv) A student who is dismissed from the University for any reason will not be entitled to a refund of fees.
- v) Refunds will not be made to a student who has paid an admission deposit for a Specified Limited Enrollment Programme.
- vi) In any Specified Limited Enrollment Programme (See Appendix I) the first installment of fees is not refundable except on compassionate grounds (eg. illness).
- vii) Refunds will be made to the Bank for fees paid by Canada Student Loans.
- viii) Refunds will be prorated on fees paid by Scholarships.
- ix) A valid Dalhousie University ID must be presented in order for the student to receive a refund cheque.

### Dates for Refund - Regular Session

A student withdrawing or changing a class after September 23 will be charged full incidental fees and may receive a refund of the balance on a proportional basis (See Appendices III and IV on pages 26 and 27).

A student withdrawing or changing a class in January will be charged the full first installment of fees.

A student changing from full-time to part-time status before February 1, must have the approval of the Registrar and will then be eligible for an adjustment in fees for the remainder of the session.

*No refunds will be made to students withdrawing after January 31.*

### Dates for Refund - First Term

A student withdrawing or changing a class after September 23 will be charged full incidental fees and may receive a refund of the balance on a proportional basis as specified in Appendices III and IV on pages 26 and 27.

No refunds will be made to students withdrawing or changing a class after October 21.

### Dates for Refund - Second Term

A student withdrawing or changing a class after January 17 and before February 20 will be charged full incidental fees and may receive a refund of the balance on a proportional basis as specified in Appendices III and IV on pages 26 and 27.

### Delinquent Accounts

Accounts are considered delinquent when the balance of fees has not been paid by September 23 (January 31 for students registered for the winter term only). Where payment in two installments is permitted the remaining balance is due January 31.

Interest at a monthly rate set by the University will be charged on delinquent accounts for the number of days overdue.

At the time of printing the monthly rate of interest is 1.42% (17% per annum).

A student whose account is delinquent for more than 30 days will be denied University privileges including access to transcripts and records of attendance, Dalplex and the libraries. The student will be reinstated upon payment of the fees outstanding, the arrears interest and a \$50.00 reinstatement fee. Students will not be permitted to register for another session until all outstanding accounts are paid in full. Subsequently, if the bank returns the cheque, the student may be de-registered.

Students whose accounts are delinquent on March 15 may not be eligible, at the sole discretion of the University, for graduation at the May convocation. For October or February graduation the dates are Sept. 1 and Jan. 1

respectively.

Accounts which become seriously delinquent may be placed on collection or further legal action may be taken against the individual. Students will be responsible for charges incurred as a result of such action.

### Canada Student Loans

Students planning to pay the first installment of fees from a Canada Student Loan should apply to the Province in April or May so that funds will be available in time for registration. The University will deduct fees/charges from the loan at the time of endorsement.

### Provincial Bursaries and University Scholarships

These cheques are distributed by the Student Accounts Office. Any unpaid Fees and/or Temporary Loans along with charges, if applicable, are deducted and a University cheque will be issued within one week of endorsement for any balance remaining. A valid Dalhousie University ID and Social Insurance Number must be presented in order to receive these cheques. For more information on Student Loans, Bursaries or Scholarships inquiries should be directed to the Awards Office located on the first floor of the Arts & Administration building, Room 125. Telephone (902) 494-2416.

### Income Tax Credit from Academic Fees

The amount of academic fees constituting an income tax credit is determined by Revenue Canada, Taxation. Currently, the tax credit for students is calculated by deducting the following from Academic Fees: Student Union Fees, and Society Fees. Seventeen percent (17%) of the remaining balance constitutes the tax credit.

For all eligible fees, a special income tax certificate will be available at Student Accounts annually on February 28. Replacement tax receipts will be provided within 3 weeks of the request, for an additional charge of \$5.00 per receipt.

### Identification Cards

All full and part-time students should obtain identification cards upon registration and payment of proper fees. If a card is lost, a fee of \$12.00 is charged. Regular academic year ID cards remain valid until the beginning of the following academic year (including summer session).

### Laboratory Deposits

A deposit for the use of laboratory facilities in certain departments is required. The deposit is determined and collected by these departments. Students will be charged for careless or willful damage regardless of whether or not a deposit is required.



### Dalplex Recreational Fee

Membership at Dalplex for 1990-91 is available for all full-time students at Dalhousie and all part-time students at Dalhousie taking three full credit courses for \$45.00 payable at registration. Membership in Dalplex for ALL other part-time students at Dalhousie may be obtained at the office of Dalplex at the prevailing rates.

### Student Union Fee Distribution

Every student registered at Dalhousie is automatically a member of the Student Union and is therefore required to pay a Student Union fee as part of their registration procedure. These fees have been approved by students in referenda and, along with other revenue of the Union, are allocated each year by the Student Council in a budget.

What follows is the breakdown of how Student Union fees are spent. If you have any questions or comments please contact the Student Union Office located in Room 222 of the S.U.B., Telephone No. 494-2146.

#### 1990 - 91 Student Union Fee (For Information Only)

	Full-Time (3 credits or more)
General Income	
For Operations	\$40.00
Student Health	
Plan Insurance	\$36.00
Contributions to	
Capital Campaign	\$15.00
Capital Payback for	
Student Union Building	\$10.00
C K D U - FM	\$ 9.00
Yearbook Fee	\$ 5.00
Canadian Federation of	
Students' Membership	\$ 4.00
Students' Union of	
Nova Scotia Membership	\$ 3.00
Course Evaluation	\$ 1.00
South African Trust Fund	\$ 1.00
Public Interest Research Group	\$ 4.00
	-----
<b>TOTAL</b>	<b>\$128.00</b>

**Appendix I**

**Definition of Specified Limited Enrolment Programmes**

**Master of Business Administration**  
**Master of Library Service**  
**Master of Public Administration**

All programmes in the following faculties:

**Faculty of Dentistry**  
**Faculty of Law**  
**Faculty of Medicine**  
**Faculty of Health Professions**

**Appendix II**

**Miscellaneous Fees - Quick Reference**

<b>Fees</b>	<b>Amount</b>	<b>Payable To</b>
Replacement Tax Receipt	\$ 5.00	Student Accounts
Late Registration	\$ 50.00	Student Accounts
Returned Cheque	\$ 15.00	Student Accounts
Reinstatement Fee	\$ 50.00	Student Accounts
Admission Deposit	\$ 100.00	Registrar
Application Fee	\$ 20.00	Registrar
Letter of Permission • per class - maximum \$ 50.00	\$ 10.00	Registrar
Reassessment Fee	\$ 10.00	Registrar
Replacement ID	\$ 12.00	Registrar
Transcript	\$ 4.00	Registrar
Priority Transcript Fee	\$ 10.00	Registrar
FAX Fee	\$ 5.00	Registrar
Application Fee - Residence	\$ 25.00	Residence

## Appendix III

## Fee Refunds

All Faculties (except Specified Limited Enrolment Programmes), including Graduate Studies.

Student Union: Non Refundable after Sept. 23 (Second term Jan. 6)

Dalplex Recreational Fee: Non Refundable after Sept. 23 (Second term Jan. 6)

Society Fee: Non Refundable after Sept. 23 (Second term Jan. 6)

University Fee: As follows:

Withdrawal Date	Regular Session <sup>1</sup>	First Term Only <sup>2</sup>	Second Term Only <sup>3</sup>	Thesis only Graduate Studies	Part Time Degree Graduate Studies	½ Credit Full Year
Up to Sept. 23	95%	95%	100%	95%	95%	95%
Sept. 24 - Oct. 21	85%	67%	100%	85%	85%	85%
Oct. 22 - Nov. 12	70%	0%	100%	70%	70%	70%
Nov. 13 - Dec. 31	50%	0%	100%	50%	50%	50%
Jan. 1 - Jan. 20	2nd Inst.	0%	95%	43%	2nd Inst.	43%
Jan. 21 - Jan. 31	2nd Inst.	0%	67%	43%	2nd Inst.	43%
Feb. 1 - Feb. 16	0%	0%	67%	0%	0%	0%
After Feb.16	0%	0%	0%	0%	0%	0%

<sup>1</sup> Applicable to all students except those registered for one term.

<sup>2</sup> Applicable to all students registered full-time one term (First) and part-time undergraduate students taking only "A" classes.

<sup>3</sup> Applicable to all student registered full-time one term (Second) and part-time undergraduate students taking only "B" classes.

**Appendix IV**

**Fee Refunds  
Specified Limited Enrolment Programmes**

**Admission Deposit:** Non Refundable (after July 1 for School of Nursing, College of Pharmacy, and School of Recreation, Physical and Health Education).

**Student Union:** Non Refundable after 1st day of classes (Second term Jan. 6)

**Dalplex Recreational Fee:** Non Refundable after Sept. 23 (Second term Jan. 6)

**Society Fee:** Non Refundable after 1st day of classes (Second term Jan. 6)

**University Fee:** As follows:

Withdrawal Date	Regular Session	First Term Only	Second Term Only	½ Credit Full Year
1st day of class to Jan. 15	2nd Inst.	0%	0%	0%
Jan. 16 - Jan. 31	2nd Inst.	0%	0%	0%
After Jan. 31	0%	0%	0%	0%

## Dalhousie University Residence Room and Board Rates 1990-1991

The residence term for Howe Hall, Shirreff Hall, Eliza Ritchie Hall, Glengary Apartments and the Women's Residence Houses covers the time period from the Wednesday in September before classes begin in the College of Arts and Science to the last regularly-scheduled examination in the College of Arts and Science to the last regularly-scheduled examination in the College of Arts and Science in April (Christmas vacation excluded).

The residence term for Fenwick Place is as follows: First semester - Labour Day to December 31, 1990; and second semester - January 1, 1991, to April 30, 1991.

NOTE: Those students wishing to stay past the end of the residence term may stay longer for a daily or weekly rate. Please contact the residence in question regarding the specific rate and the amount of notice required.

	FIRST DEPOSIT AND APP. FEE	SECOND DEPOSIT AT JULY 15	BALANCE IF PAID IN FULL BY SEPT. 30	OR	PAY IN PART BY SEPT. 30	BALANCE DUE BY JAN. 31	TOTAL (Includes \$10 Service Charge)
<b>Howe Hall</b>							
Single Room	\$125	\$200	\$3,955	Or	\$1,990	\$1,975	\$4,290
Double Room	\$125	\$200	\$3,630	Or	\$1,990	\$1,850	\$3,995
<b>Shirreff Hall and Eliza Ritchie Hall</b>							
Single Room	\$125	\$200	\$3,955	Or	\$1,990	\$1,975	\$4,290
Double Room	\$125	\$200	\$3,685	Or	\$1,990	\$1,705	\$4,020
<b>Residence Houses</b>							
Single Room	\$125	\$200	\$2,215	Or	\$1,115	\$1,110	\$2,550
Double Room	\$125	\$200	\$1,895	Or	\$1,115	\$ 790	\$2,230
<b>Glengary Apartments</b>							
Single Room	\$125	\$200	\$2,220	Or	\$1,115	\$1,115	\$2,555
Double Room	\$125	\$200	\$1,920	Or	\$1,115	\$ 815	\$2,255
Bachelor Apts.	\$125	\$20	\$3,180	Or	\$1,800	\$1,590	\$3,515
<b>Fenwick Place</b>							
Student-Shared Apts.							
2-Person (2-Bdrm.)	\$125	\$200	\$3,000	Or	\$1,400	\$1,800	\$3,200
3-Person (2-Bdrm.)	\$125	\$200	\$2,714	Or	\$1,257	\$1,457	\$2,914
4-Person (4-Bdrm.)	\$125	\$200	\$2,394	Or	\$1,097	\$1,297	\$2,594
<b>Meals Only - Special Rate for Session</b>							
3 Meals Per Day	\$1,792						
2 Meals Per Day	\$1,738						

Meals - Only Plans may be purchased from the Administrative Office at Howe Hall and Shirreff Hall.

Please note the following:

- (1) The above fees will be superseded on July 1, 1991, when the 1991/1992 residence fee schedule will be published.
- (2) Howe Hall, Shirreff Hall and Eliza Ritchie Hall rates include a residence council membership fee and a mandatory 21-meal plan.
- (3) For all residences the prepaid deposit of \$125 includes a \$25 application fee which is nonrefundable.
- (4) The balance paid in January includes a service charge of \$10.
- (5) At Fenwick Place \$100 of the \$125 prepaid deposit is a damage deposit. See application form for details. The \$10 service charge is not applicable.
- (6) The second deposit due on July 15 is a \$200 nonrefundable deposit to confirm the room.

# University Regulations

## General

1. The Senate is charged with the internal regulation of the University, including all matters relating to academic affairs and discipline, subject to the approval of the Governors. Within the general policies approved by Senate, academic requirements are administered by the Faculty concerned.
2. All students must agree to obey all the regulations of the University already made or to be made; in addition to the above University regulations, students must also comply with the regulations of the Faculty in which they are registered, and pay the required fees and deposits before entering any class or taking any examinations. Additionally, students are advised that this Calendar is not an all-inclusive set of rules and regulations but represents only a portion of the rules and regulations that will govern the student's relationship with the University. Other rules and regulations are contained in additional publications that are available to the student from the Registrar's Office and/or the relevant Faculty, Department or School.
3. For the purpose of admission to the University, the place of residence of a student is the place of domicile. This is normally presumed to be the place (country, province, etc.) where the parents' or guardian's home is located. That place remains unchanged unless the Registrar is satisfied that a place of residence is established elsewhere. No person under sixteen years of age is admitted to any class except by special permission of the Senate.
4. All students must report their local address while attending the University to the Office of the Registrar, on registration or as soon as possible thereafter. Subsequent changes must be reported promptly.
5. Students taking classes in another Faculty as part of an affiliated course must conform to the regulations of that Faculty with respect to these classes. It should be noted, however, that regulations pertaining to the degree programme are those of the "home" Faculty.
6. In the interests of public health in the University, students are encouraged to have a tuberculin test. This is compulsory for Dental, Dental Hygiene and Physiotherapy students. Facilities for testing are arranged by the University Health Services.
7. Except for university purposes, transcripts, official, or unofficial, will be issued only on the request of the student on payment of the required fee. A student may receive only an unofficial transcript. Official transcripts will

be sent at a student's request to other universities, or to business organizations, etc. on payment of the required fee.

8. Students withdrawing voluntarily from the University should consult the individual faculty regulations and the Fees section of this Calendar.
9. When the work of a student becomes unsatisfactory, or a student's attendance is irregular without sufficient reason, the faculty concerned may require withdrawal from one or more classes, or withdrawal from the Faculty. If a student is required to withdraw from a Faculty such a student may apply to another Faculty. However, in assessing the application, previous performance will be taken into consideration.
10. Any graduating student who is unable to appear at the convocation is expected to notify the Registrar in writing prior to May 1, for Spring convocations (or October 1 for Fall convocations), giving the address to which the diploma is to be mailed. Students whose accounts are delinquent on March 15 may not be eligible, at the sole discretion of the University, for graduation at the May convocation. For October or February graduation the dates are Sept. 1 and Jan. 1 respectively.
11. Students should be aware that certain classes at the University involve required laboratory work where radioactive isotopes are present and are used by students. Since there are potential health risks associated with the improper handling of such radioactive isotopes, Dalhousie University requires that, as a condition of taking a class where radioactive isotopes are to be used, students read and agree to comply with the instructions for the safe handling of such radioactive isotopes. In the event that students do not comply with the instructions for the safe handling of radioactive isotopes, students will receive no credit for the required laboratory work unless other acceptable alternatives are arranged with the instructor. In many cases, alternate arrangements are not possible and students should consider enrolling in a different class.

## Release of Information About Students

1. Disclosure to students of their own records
  - (a) Students have the right to inspect their academic record. An employee of the Registrar's Office will be present during such an inspection.
  - (b) Students will, on submission of a signed request and payment of the appropriate fee, have the right to receive transcripts of their own academic record. These transcripts will

be marked "ISSUED TO STUDENT". Students who owe monies to the University will not receive copies of their transcript.

## 2. Disclosure to Faculty, Administrative Officers, and Committees of the University

Information on students may be disclosed without the consent of the student to University officials or committees deemed to have a legitimate educational interest.

## 3. Disclosure to Third Parties

- (a) The following information is considered public information and may be released without restriction:
  - Name
  - Period of Registration
  - Certificates, Diplomas, Degrees awarded
- (b) Information will be released without student consent to persons in compliance with a judicial order or subpoena or as required by federal or provincial legislation.
- (c) Necessary information may be released without student consent in an emergency, if the knowledge of that information is required to protect the health or safety of the student or other persons. Such requests should be directed to the Registrar.
- (d) Other than in the above situation, information on students will be released to third parties only at the written request of the student, or where the student has signed an agreement with a third party, one of the conditions of which is access to her/his record (e.g. in financial aid). This restriction applies to requests from parents, spouses, credit bureaus and police.

## Intellectual Honesty

1. A University should epitomise the quest for intellectual honesty. Failure to measure up to the quest for such a standard can involve either academic offences at one end of the spectrum or substandard work warranting lowered or failing grades at the other. The seniority of the student concerned, the presence of a dishonest intent, and other circumstances may all be relevant to the seriousness with which the matter is viewed.
2. **Plagiarism or Self-Plagiarism**

Dalhousie University defines plagiarism as the presentation of the work of another author in such a way as to give one's reader reason to think it to be one's own. Plagiarism is a form of academic fraud.

Plagiarism is considered a serious academic offence which may lead to loss of credit, suspension or expulsion from the University, or even the revocation of a degree.

In its grossest form plagiarism includes the use of a paper purchased from a commercial research corporation, or prepared

by any person other than the individual claiming to be the author.

Self-plagiarism is the submission of work by a person which is the same or substantially the same as work for which he or she has already received academic credit.

## 3. Irregularities in the Presentation of Data from Experiments, Field Studies, etc.

Academic research is predicated on the presentation of accurate and honestly derived data. The falsification of data in reports, theses, dissertations and other presentations is a serious academic offence, equivalent in degree to plagiarism, for which the penalties may include revocation of degrees, loss of credits or suspension or expulsion from the University.

## 4. Inaccurate or Inadequate Attribution

The University attaches great importance to the contribution of original thought to scholarship. It attaches equal importance to the correct attribution of authorities from which facts and opinions have been derived.

The proper use of footnotes and other methods of attribution varies from discipline to discipline. Failure to abide by the standards of the discipline concerned in the preparation of essays, term papers and dissertations or theses can result, at the discretion of the instructor or faculty member involved, in lowered grades. It can also lead to the requirement that an alternative assignment be prepared. Such grading penalties can be involved even in the absence of any **INTENTION** to be dishonest.

Students who are in any doubt about the proper forms of citation and attribution of authorities and sources should discuss the matter in advance with the faculty member for whom they are preparing assignments. In many academic departments, written statements on matters of this kind are made available as a matter of routine or can be obtained on request.

## Discipline

1. Members of the University, both students and staff, are expected to comply with the general laws of the community, within the University as well as outside it.
2. Alleged breaches of discipline relating to student activities under the supervision of the Dalhousie Student Union are dealt with by the Student Union. Alleged breaches of discipline relating to life in the residences are dealt with by the appropriate Dean or Director of Residence in consultation with the relevant Residence Council. Senate is

charged with the authority to deal with cases of alleged academic offences (as delegated to the Senate Discipline Committee), as well as with certain other offences that are incompatible with constructive participation in an academic community.

### 3. Examples of Academic Offenses

#### Plagiarism

As indicated above, plagiarism and self-plagiarism are considered serious academic offences which can lead to loss of credit and suspension from the University.

#### Irregularities in Presentation of Data

As defined above, the presentation of falsified data in reports, theses, dissertations and other presentations is a serious academic offence, equivalent in degree to plagiarism for which the penalties may include revocation of degrees, loss of credits, or suspension or expulsion from the University.

#### Irregularities in Admissions Procedures

A person who gains admission or assists any other person in gaining admission by any irregular procedure, for example, by falsifying an academic record or by forging a letter of recommendation or by impersonating any other person, commits an academic offence and is liable to a penalty (see Senate Discipline Committee).

#### Irregularities in Evaluation Procedures

A member of the University who attempts or who assists any other person in an attempt to obtain, by irregular procedures, academic standing in a course related to any degree, diploma or certificate programme, commits an academic offence and is liable to a penalty. Without limiting possible irregularities in evaluation procedures that may be considered by the Senate Discipline Committee, the following examples shall be considered irregular procedures:

- (a) arranging for or availing oneself of the results of any personation at any examination or test, or,
- (b) attempting to secure or accepting assistance from any other person at any examination or test, or,
- (c) having in one's possession or using any unauthorized material during the time that one is writing any examination or test, or,
- (d) without authorization procuring a copy of an examination, test or topic for an essay or paper, or,
- (e) in the absence of any enabling statement by the Faculty member in charge of that course, submitting any thesis, essay, or paper for academic credit when one is not the sole author, or,
- (f) without authorization submitting any thesis, essay or term paper that has been accepted in one course for

academic credit in any other course in any degree, diploma or certificate programme.

4. On report of a serious breach of the law, or a serious academic offence deemed by the President, or in his or her absence by a Vice-President or the Dean of a Faculty, to affect vital University interests, a student involved may be temporarily suspended and denied admission to classes or to the University by the President, Vice-President or Dean, but any suspension shall be reported to the Senate, together with the reasons for it, without delay.
5. No refund of fees will be made to any student required to lose credit for any course taken, required to withdraw or who is suspended or dismissed from any class or any Faculty of the University.

## Official Examination Regulations

1. Candidates will not be admitted to the Examination Room more than thirty minutes after the beginning of the examination. Candidates will not be permitted to leave the examination within the first thirty minutes.
2. Candidates are required to present their valid Dalhousie ID card at all examinations scheduled during the official examination periods and sign the signature list.
3. No articles such as books, papers, etc. may be taken into the examination room unless provision has been made by the examiner for reference books and materials to be allowed to the students. All books, papers, etc. not specified on the printed paper must be deposited with the invigilator. Calculators may be used at the discretion of the instructor.
4. Smoking is not permitted in the examination room.
5. Candidates may not leave their seats during an examination except with the consent of the invigilator.
6. Answers to questions must be written on the right hand pages and properly numbered. The left hand pages may be used for rough work, but no sheets may be detached.
7. Each question should be started on a separate page.
8. If more than one book is used, the total number should be marked in the space provided above. The other books should be properly marked and placed inside the first book. All books supplied must be returned to the invigilator.
9. Candidates found communicating with one another in any way or under any pretext whatever, or having unauthorized



books or papers in their possession, even if their use be not proved, shall be subject to expulsion.

10. After the first thirty minutes have elapsed, students may hand in their examination book(s) to an invigilator and quietly leave the examination room. Candidates may not leave the examination room during the last fifteen minutes of the examination.

## Senate Discipline Committee

### 1. Composition

Academic Offences are dealt with by the Senate Discipline Committee, which consists of five members, three of which are members of the Senate and two of which are students.

### 2. Terms of Reference

- (a) The Senate Discipline Committee is vested with original jurisdiction to consider all complaints or allegations respecting offences or irregularities of an academic nature, including those relating to admissions procedures and evaluation procedures, and to impose penalties in cases where the Committee finds an offence or irregularity has occurred.
- (b) The Senate Discipline Committee shall assume jurisdiction when a complaint or allegation respecting offences or irregularities of an academic nature are brought to its attention by the Secretary of Senate.
- (c) The Senate Discipline Committee, when it finds that a member of the University who is a student has committed an academic offence or irregularity may impose one or more penalties as indicated in 3. below.
- (d) The Senate Discipline Committee shall report its findings and any penalty imposed to the Secretary of the Senate. The Secretary of the Senate shall forward a copy of the report to any member of the University community whom the Senate Discipline Committee has found to have committed an offence or irregularity and if the member concerned be other than a student a copy shall also be sent to the Vice-President (Academic).
- (e) If the member of the University found to have committed an offence or irregularity is a student, she/he may appeal to Senate any finding or any penalty imposed by the Senate Discipline Committee by advising the Secretary of the Senate in writing within 30 days of receipt of the report by the student.

### 3. Academic Penalties

- (a) loss of all credit for any academic work done during the year in which the offence occurred;
- (b) suspension of rights to attend the University for a specified period;
- (c) dismissal from the University;
- (d) such lesser penalty as the Committee deems appropriate where mitigating circumstances exist.

## Guide to Responsible Computing

In recognition of the contribution that computers can make to furthering the educational and other objectives of the University, this Guide is intended to promote the responsible and ethical use of University computing resources. It is in the best interests of the community as a whole that these resources be used in accordance with certain practices which ensure that the rights of all users are protected and the goals of the University are achieved.

This Guide applies to all computer and computer communication facilities owned, leased, operated, or contracted by the University. This includes word processing equipment, micros, mainframes, minicomputers, and associated peripherals and software, regardless of whether used for administration, research, teaching, or other purposes.

It should be noted that system administrators of various campus computing facilities and those responsible for the computer access privileges of others may promulgate regulations to control use of the facilities they regulate. System administrators are responsible for publicizing both the regulations they establish and their policies concerning the authorized and appropriate use of the publicly available equipment for which they are responsible.

### Basic Principles

Individuals should use only those University computing facilities they have been authorized to use.

They should use these facilities:

- with respect to the terms under which they were granted access to them;
- in a way that respects the rights of other authorized users;
- so as not to interfere with or violate the normal, appropriate use of these facilities;
- so as not to impose unauthorized costs on the University without compensation to it.

### Elaboration

- Individuals should use only those University computing facilities they have been authorized through normal University channels to use. They should use these

- resources in a responsible and efficient manner consistent with the objectives underlying their authorization to use them.
2. Individuals should respect the rights of other authorized users of University computing facilities. Thus, they should respect the rights of other users to security of files, confidentiality of data, and the benefits of their own work. Users should respect the rights of others to access campus computing resources and should refrain from:
    - (1) using the computer access privileges of others without their explicit approval;
    - (2) accessing, copying, or modifying the files of others without their permission; and,
    - (3) harassing others in any way or interfering with their legitimate use of computing facilities.
  3. Individuals should respect the property rights of others by refraining from the illegal copying of programmes or data acquired by the University or other users or putting software, data files, etc. on University computers without the legal right to do so.
  4. Individuals should not attempt to interfere with the normal operation of computing systems or attempt to subvert the restrictions associated with such facilities. They should obey the regulations affecting the use of any computing facility they use.

### **Disciplinary Actions**

Reasonable suspicion of a violation of the principles or practices laid out in this Guide may result in disciplinary action. Such action will be taken through normal University channels.

Nothing in this Guide diminishes the responsibility of system administrators of computing services to take remedial action in the case of possible abuse of computing privileges. To this end, the system administrators with the approval of the President and with due regard for the right of privacy of users and the confidentiality of their data, have the right, to suspend or modify computer access privileges, examine files, passwords, accounting information, printouts, tapes, and any other material which may aid in an investigation of possible abuse. Whenever possible, the cooperation and agreement of the user will be sought in advance. Users are expected to cooperate in such investigations when requested. Failure to do so may be grounds for cancellation of computer privileges.

## Faculty of Graduate Studies

**Location:** Arts & Administration Building,  
Room 314  
Halifax, N.S. B3H 4H6  
**Telephone:** (902) 494-2485  
**Fax:** (902) 494-8797

### Administrative Officers

#### Dean

J. Fingard, BA (Dal), MPhil, PhD (Lond.)

#### Associate Dean

J.H.M. Willison, BSc (St. Andrews), PhD (Nottingham)

#### Secretary

D. McNeil, BA (Concordia), MA (UNB), PhD (McM)

#### Administrative Assistant

A.R. Thomson

### Council and Standing Committees

The figure following a member's name is that individual's year of completion of term.

#### Faculty Council

K. Loudon	'91 Oceanography
D. McNeil	'91 English - Secretary
G. Gabor	'91 Math, Stats. & Computing Science
J. Stolzman	'91 Sociology/Social Anthropology
D. House	'91 Classics
R. Stephens	'91 Chemistry
D. Jones	'92 Pharmacy
E. Frick	'92 Library & Information Studies
A. Manicom	'92 Education
W. Mitic	'92 Recreation, Phys & Health Ed.
S. Sherwin	'92 Philosophy
H. Bakvis	'93 Political Science
R. Currie	'93 Anatomy
C. Stuttard	'93 Microbiology
D. VanderZwaag	'93 Law
H. Whitehead	'93 Biology
W. Birdsall	University Librarian
C. Porteous	Business Admin (DAGS Rep.)
J.H.M. Willison	Associate Dean
J. Fingard	Dean

(Each discipline to have only one elected member on Council at a given time.)

### Academic Planning Committee of Council

J. Stolzman	'91 Sociology/Social Anthropology
R. Stephens	'91 Chemistry
S. Sherwin	'92 Philosophy
E. Frick	'92 Library & Info. Studies
C. Stuttard	'93 Microbiology
D. VanderZwaag	'93 Law
J. Fingard	Dean
J.H.M. Willison	Associate Dean
D. McNeil	Secretary to Faculty
C. Porteous	Student Representative

### Scholarship Committee

P. Atheron	'91 Classics
A.H. Blair	'91 Biochemistry
R. Lee	'92 Biology
F. Cohen	'92 Resource & Environmental Studies
E. Belzer	'93 Recreation, Phys & Health Ed
B. Greenfield	'93 English
J. Grossert	'93 Chemistry
J.H.M. Willison	Associate Dean

### Killam Postdoctoral Fellowship

R. Apostle	'91 Sociology/Social Anthropology
R.P. Gupta	'91 Math, Stats. & Comp. Science
P.H. Reynolds	'91 Geology
C. Marfels	'92 Economics
J. Pincock	'92 Chemistry
E. Angelopoulos	'92 Biology
P. DeMeo	'93 French
J. Downie	'93 Pharmacology
A. Bonen	'93 Recreation, Phys. & Health Ed
J.H.M. Willison	Associate Dean

### Research Development Fund Social Sciences & Humanities

J. Barkow	'91 Sociology/Social Anthropology
P. Girard	'91 Law
D.P. Varma	'92 English
C.T. Sinclair-Faulkner	'92 Comp. Religion
R. Friedrich	'93 Classics
B. MacDonald	'93 Library & Info. Studies
C. Marfels	'93 Economics
J. Fingard	Dean

### Research Development in the Sciences

A. Bonen	'93 Recreation, Phys. & Health Ed.
R. Wassersug	'93 Anatomy
Chairperson	Biology
Chairperson	Chemistry
Chairperson	Geology
Chairperson	Math, Stats. & Computing Science
Chairperson	Oceanography
Chairperson	Physics
Chairperson	Psychology
J.H.M. Willison	Associate Dean - Chair

**Killam Lecture Committee**

J. Kreuzer	'91 Physics
G. Gabor	'92 Math. Stats. & Comp Science
A. Barton	'92 Education
M. Yoon	'92 Psychology
J. Barreal	'93 Psychology
N. Treves	'93 French
J. Fingard	Dean

**Human Ethics Review Committee**

N. Brett	'91 Philosophy
P. Dunham	'91 Psychology
H. Robertson	'91 Pharmacology
A. Young	'91 Recreation, Phys & Health Ed
M. Arkle	'92 Nursing
R. Boardman	'93 Political Science
J.H.M. Willison	Associate Dean (Coordinating Chair)

**Academic Appeals Committee**

R.D. Guy	'91 Chemistry
R. Bérard	'92 Education
M. Cassin	'93 Public Admin.

**Reserve Panel for Academic Appeals Committee**

M.L. Courtney	'91 Social Work
M. Cassin	'92 Public Admin
G. Morgan	'93 Sociology & S.A.
W. Charles	'93 Law

**Library Representatives on Faculty**

J. Coughlan-Lambly	'92 Kellog Library
Lai Haiung	'92 Killam Library
P. Lutley	'92 Macdonald Science Library
H. Melanson	'92 Killam Library

**Studley Audio-Visual Ad Hoc Committee**

G. Gabor	Math, Stats & Computing Science-Faculty's Rep.
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**Honourary Faculty Appointments**

Highly qualified scientists and scholars on the staff of neighbouring institutions and government laboratories cooperate with the research and graduate degree programme at Dalhousie on a part-time basis. These persons, and other individuals in or close to the University community, are appointed to honorary faculty positions. Honorary Research Associates cooperate with members of the University departments in the direction, or evaluation, of graduate research. Such cooperation may take the following forms:

1. serving on a student's advisory committee
2. serving as a departmental reader on a student's thesis
3. serving as co-supervisor of a thesis
4. participation in graduate seminars.

Honorary Adjunct Professors may cooperate with members of the University departments in all of the above ways and, in addition, may teach

regular or special lecture and/or laboratory classes by mutual consent of the Adjunct Professor, the Department, and the Faculty of Graduate Studies. Honorary Research Associates and Adjunct Professors in the Faculty of Graduate Studies are listed under appropriate departments.

**Faculty Regulations**

General regulations and administrative procedures are outlined in this section. Detailed information about particular programmes will be found in the Departmental entries in the subsequent sections of this calendar or may be obtained from Departmental publications. Graduate students are urged to familiarize themselves with the regulations which govern the conditions of their programmes of study at the University.

**1. Degree Programmes**

Departments in the Faculty of Graduate Studies offer programmes leading to the following degrees:

- Doctor of Philosophy (PhD)
- Doctor in the Science of Law (JSD)
- Master of Arts (MA)
- Master of Business Administration (MBA)
- Master of Development Economics (MDE)
- Master of Education (MEd)
- Master of Environmental Studies (MES)
- Master of Health Services Administration (MHSA)
- Master of Laws (LLM)
- Master of Library and Information Studies (MLIS)
- Master of Nursing (MN)
- Master of Public Administration (MPA)
- Master of Science (MSc)
- Master of Social Work (MSW)
- Master of Teaching (French) (MAT)
- Diploma in Aquaculture (Dip A)
- Diploma in Marine Affairs (Dip MA)
- Diploma in Public Administration (Dip PA)

**1.1 Conferring of Degrees**

Successful candidates for degrees are ordinarily required to appear at Convocation in the proper academic costume to have the degree conferred upon them. By special permission of the Senate, degrees may be conferred, in exceptional cases, *in absentia*. Any graduating student who is unable to appear at the convocation is expected to notify the Registrar in writing prior to May 4, or October 11 for Fall convocation, giving the address to which the diploma is to be mailed.

**1.2 Academic Costume**

Graduates of the University are entitled to wear gowns and hoods of black stuff. The distinctive part of the costume is the lining of the hood, which for the various degrees is as follows:

- MA: Crimson silk
- MAT: Crimson silk/white border
- MBA: Turquoise silk
- MDE: Medium blue/scarlet border
- MEd: Royal Blue silk
- MES: Brown silk
- MHSA: Sky blue silk/white border
- LLM: Purple silk
- MLIS: Mid-forest Green silk
- MN: Apricot silk
- MPA: Sky Blue silk
- MSc: Scarlet silk
- MSW: Citron silk
- PhD: Entitled to wear a gown of black stuff faced with yellow silk. The hood is of black corded silk with a lining of yellow silk and of the Cambridge design. The birretum is the doctor's bonnet of black velvet with yellow cord.
- JSD: Entitled to wear a gown of black stuff faced with olympic blue silk bordered with yellow silk. The hood is of black corded silk with a lining of olympic blue silk bordered with yellow silk and of the Cambridge design. The birretum is the doctor's bonnet of black velvet with yellow and blue cord.

**2. Admission Requirements**

The following are minimum requirements for admission to the Faculty of Graduate Studies. Individual Departments may require additional qualifications of their candidates.

**2.1 English Language Competency**

Candidates from outside Canada whose native language is other than English must demonstrate their capacity to pursue a graduate-level programme in English. Such candidates should submit the results of a TOEFL or other standard English competency test at the time of application. The Faculty sets a minimum acceptable score of 550 for the TOEFL. However, candidates are advised that some programmes within the Faculty set higher English language requirements.

Further information on the test may be obtained from Test of English as a Foreign Language, Box 899, Princeton, NJ, 08540, USA.

**2.2 Master's Degree Programme**

Candidates must hold a Bachelor's Degree from a university of recognized standing with:

- (a) honours or the equivalent of honours standing as granted by Dalhousie University, in the area in which graduate work is to be done, or
- (b) completion of at least four (4)

undergraduate classes, or their equivalent, in the area in which graduate work is to be done, with an average of at least B.

Only candidates with honours or the equivalent of honours standing may be able to complete the requirements for the degree in a twelve-month period of full-time study. Students normally take two years.

Candidates who do not meet the minimum admission requirements stated above may, upon the recommendation of the Department, be admitted to a preliminary year of study. This year is known as the Qualifying Year. At the end of the Qualifying Year, students must reapply for admission. Completion of the Qualifying Year may not be offered as a substitute for the first year of graduate work.

**2.3 Doctoral Degree Programme**

Candidates must hold:

- (a) a Bachelor's Degree from a recognized university with first class honours standing as granted by Dalhousie University, or
- (b) a Master's Degree, or its equivalent, from a recognized university.

Only candidates with a Master's Degree (normally in the area of PhD study), or equivalent, may be able to complete the requirements for the degree in two (2) years of full-time study. Students normally take 4/5 years.

**3. Application**

Application for Admission forms may be obtained from the Registrar's Office, Dalhousie University, and should be returned to that office along with the application fee. All supporting materials should be sent directly to the Department to which the student is applying. Application deadlines for the Faculty are May 1 for non-Canadian applicants and July 15 for applicants from Canada, except where special dates apply (see page 4). Any application received after July 15 will, in the event that it is accepted, incur an automatic late penalty.

**4. Financial Aid**

The various kinds of scholarship aid for which graduate students may apply are detailed in the section on "Scholarships and Fellowships." In the case of Dalhousie graduate scholarships, the application for admission serves as an automatic application for scholarship consideration if the appropriate box is marked. Students who wish to be considered for scholarship assistance are advised to submit their applications no later than March 1. Advice concerning other forms of financial assistance may be requested from the Awards Office.

## 5. Registration

All students must register in September of each year of their graduate programme in one of the following categories:

**Full-Time:** a student who is carrying more than two and one-half (2 1/2) full-credit classes during the 12-month academic year or a student who has not yet completed the minimum number of years of full-time study required for a particular degree programme.

**Part-Time:** a student who is carrying not more than two and one-half (2 1/2) full credit classes during the 12 months, September to August or a student who has not yet completed the minimum number of years of part-time study required for a particular degree programme.

**Part Time Continuing:** a student who is continuing in a part-time programme after fulfilling the maximum residency requirement permitted for part-time study. (See section 6)

**Thesis Only:** a student who has completed the minimum number of years of full-time study required for a particular degree programme and is completing degree requirements (usually the thesis). If degree requirements are being completed by full-time attendance on campus, the student is designated Full-Time Thesis Only. If the degree requirements are being completed off campus the designation is Part-Time Thesis Only.

**Qualifying:** a student who has been required to do a year of preliminary work in order to meet admission standards before being considered for acceptance into a regular programme. Classes taken in a Qualifying Year cannot be counted as credits toward a graduate degree.

**Special:** Some departments occasionally allow students to register in graduate classes as special students. This is not a graduate category but the department may require experience in graduate classes as a special student before deciding if an applicant is suitable to apply to the graduate programme.

**Registration** is the process by which the student officially establishes with the University (Registry and Faculty of Graduate Studies Office) the degree programme (MA, MSc, PhD, etc.) and status (full time, part time, etc.) and pays the appropriate academic fees (Student Accounts). Both aspects of the process (programme/status and fee payment) must be completed before a student can be said to be registered. (Most fees may be paid in two (2) instalments.)

Canadian and non-visa students may register by mail prior to the September deadline. Such students are reminded that they must inform the Graduate Studies

Office and the Registrar's Office of their current address so that forms can be sent to them. Students who do not register by mail must register in person on or before the day specified by the Faculty.

Students unable to register on or before the specified date should apply to the Faculty Office for permission to register. A late registration fee will be assessed (see Dalhousie University Fees Handbook). Any student who fails to register in September will not be allowed to submit a thesis or obtain any service whatsoever from the University during that academic year.

Students who change their registration status by the addition or deletion of classes must report this to the Faculty Office. Changes in status, i.e. part-time to full-time or full-time to part-time, cannot be made after initial registration without permission of the Dean of Graduate Studies. No changes will be allowed after 30th November. Withdrawal from a degree programme should be reported immediately to the Faculty Office since reimbursement of fees is calculated from the official date of withdrawal.

Students who need to suspend their programme of studies because of illness or other serious problem outside their control, may apply in writing through their department or school for a "leave of absence". If the department or school recommends to the Dean that leave of absence be granted, and if the Dean is also satisfied that the need is justified, such leave will be granted for the twelve month academic year commencing the 1st of September. A legitimate leave of absence does not count as a year of study.

Application for leave of absence may be made at any time of the year as long as it is no later than the final registration date (6th September, 1991) for the academic year during which leave is requested.

**Readmission of students who have dropped out of a programme:**

**Readmission within the 5-year time limit** (6 years for part-time students). The readmitted student will pay all fees for each of the years during which he or she did not register at the *current* fee rate at the time of readmission.

**Readmission after the 5-year limit** (6 years for part-time students). Provided the programme was fully paid while the student was in the programme, the readmitted student will pay one year of *full* fees at the *current* fee rate at the time of readmission. If the programme fee was not fully paid previously, the readmitted student shall pay the remainder of the programme fee, plus one extra year of full fees, both at the *current*

fee rate at the time of readmission.

**6. Residency Requirement**

The residency requirement, which must be met before a degree can be conferred, varies according to the degree programme and to the candidate's qualifications. This requirement refers to the minimum number of years that a student must spend in full-time study.

**MA/MSc**

- 1 year residency if entering with an Honours Bachelor's degree or equivalent
- 2 year residency if entering with a Pass Bachelor's degree
- 3 year residency for Human Communication Disorders (all students entering programme in 1989 and later)
- 4 year residency for Oral and Maxillofacial Surgery

**MEd**

- 1 year residency if entering with a BEd or equivalent

**MDE**

- 2 year residency if entering with a Pass Bachelor's degree

**MHSA**

- 2 year residency

**MN**

- 2 year residency

**MAT**

- 1 year residency if entering with BA Honours in French and BEd

**LLM**

- 1 year residency

**MES**

- 2 year residency, 1 year if entering with advanced professional qualifications, e.g. BEng or BArch with a concentration in environmental studies

**MLIS**

- 2 year residency

**MBA**

- 2 year residency

**Dip A**

- 1 year residency

**Dip MA**

- 1 year residency

**Dip PA**

- 1 year residency

**MPA**

- 2 year residency

**PhD**

- 2 year residency, if entering with a Master's degree or equivalent
- 3 year residency, if entering with an Honours Bachelor's degree

**JSD**

- 1 year residency if entering with thesis LLM

A qualifying year of study does not count toward fulfilment of the residency requirement.

In terms of residency, three (3) years of part-time study will be the equivalent of one (1) year of full-time study in those programmes in which part-time study is allowed; refer to departmental listing. In certain cases, on the recommendation of the Department, a student may transfer from a Master's programme to a Doctoral programme without fulfilling the Master's thesis requirement. In such cases the year of full-time residency completed in the Master's programme will be counted towards the PhD residency requirement.

**7. Fees**

Fully qualified students will pay full fees for fixed periods only, in accordance with the schedule below.

**Full Time**

From Bachelor's degree to Dip A - 1 year  
 From Bachelor's degree to Dip MA - 1 year  
 From Bachelor's degree to Dip PA - 1 year  
 From Honours Bachelor's degree to MA or MSc - 1 year

From Pass Bachelor's degree to MA or MSc - 2 years

(MSc in Human Communication Disorders and in Oral and Maxillofacial Surgery - 3 years)

From BEd to MEd - 1 year

From Honours Bachelor's degree in French plus BEd to MAT - 1 year

From Pass Bachelor's degree to MDE - 2 years

From DDS to MSc (Oral Surgery) - 3 years

From Bachelor's degree to MBA - 2 years

From Honours Bachelor's Degree to MES - 2 years (except for students admitted to 1 year programme)

From Bachelor's degree to MHSA - 2 years

From Bachelor's degree to MPA - 2 years

From Bachelor's degree to MLIS - 2 years

From Bachelor's degree to MN - 2 years

From LLB to LLM - 1 year

From Honours Bachelor's degree to PhD - 3 years

From Master's degree to PhD - 2 years

From LLM degree to JSD - 1 year

**Part Time**

Part time students will pay part-time fees (equivalent to one-third of the fee paid by a full-time student) for fixed periods as follows:

From Bachelor's degree to DPA - 3 years

From Honours Bachelor's degree to MA or MSc - 3 years

From Pass Bachelor's degree to MA or MSc - 6 years

From BEd to MEd - 3 years

From Honours Bachelor's degree in French

- plus BEd to MAT - 3 years
- From Pass Bachelor's degree to MDE. - 6 years
- From Bachelor's degree to MBA - 6 years
- From Honours Bachelor's degree to MES - 6 years (except students admitted to a one-year programme)
- From Bachelor's degree to MHSA - 6 years
- From Bachelor's degree to MPA - 6 years
- From Bachelor's degree to MLIS - 6 years
- From Bachelor's degree to MN - 6 years

Part-time students in an LLM programme will pay part-time fees (equivalent to one-half of the fee paid by a full-time student) for a period of two years.

From LLB to LLM - 2 years

**Full Time Graduate Students** pay a programme fee annually as set out above thereafter he/she pays annually a thesis-only or continuing fee. The fee is the same for all programmes except MBA, MSc Oral and Maxillofacial Surgery, LLM and JSD (see above) and does not depend upon the number of required classes taken in an academic (12 month) year. Full-time students may take between three and six and one-half (6 ½) full credit classes during the 12 month academic year starting on 1st September, according to the requirements of the programme.

**Qualifying Year Students** pay fees as set out above for full-time students.

**Part Time Graduate Students** in degree programmes must, before completion of their degree, pay fees equivalent to those paid by full-time students, plus any fees chargeable to those completing the programme as thesis-only or continuing students. Three (3) years of part-time study will be the equivalent of one (1) year of full-time study, except in an LLM programme where two (2) years of part-time study is the equivalent of one (1) year full-time. Part-time students may take up to two and one-half (2 1/2) full credit classes in a 12 month academic year except in an LLM programme where the students may take up to three (3) full credit classes in a 12 month academic year.

Graduate students registered part-time but not for degree credit pay fees on the same basis as undergraduate students.

Differential fee for non-Canadian Graduate Students must be paid for:

- Full-time Masters student (except Oral Surgery) 2 years (or equivalent)
- Full-time Masters student Oral Surgery 4 years
- Part-time Masters student 6 years
- Full-time PhD student (following a Masters degree) 3 years
- Full-time PhD student (following a Bachelors degree) 5 years

## 8. Identification Cards

Full-time, part-time students in a degree programme, and Thesis Only students, will receive ID cards entitling them to all University services.

Part-time "special" students receive ID cards which entitle them to use such facilities as libraries and laboratories.

## 9. Notification of Address

Students are required to keep the Faculty Office, the Registrar's Office, and their Department office up to date on changes of address. Notifications from the University will be sent to the most recent address possessed by these offices; students will be held responsible for complying with these notifications, and non-receipt of material because of failure to report a change of address will not excuse students from such responsibility.

## 10. Degree Requirements

A graduate student is expected to devote full time to his or her course if it is to be completed in the minimum time. The normal maximum time allowed for completion of the degree is five (5) years (six years in part-time programmes) from the first time of registration in the programme for which the degree is sought. In exceptional cases, an extension of this period may be granted by the Faculty on the recommendation of the Department.

### 10.1 Summer School Classes

In cases where a student is required by his/her department to take classes offered only during summer school, the fee will be paid by the Faculty of Graduate Studies. One credit is allowed in each Summer School session within the limits allowed by the student's programme. Recommendations should be submitted by the department before the beginning of the first summer session.

Registration dates for summer school appear in the almanac in the Graduate Studies calendar. Any student who is entitled to have the summer school fee waived must report to the Graduate Studies office before registration.

### 10.2 Requirement for the MA and MSc Degrees

The course of study will consist of work in advance of that given in ordinary undergraduate classes and will be confined to one subject or two closely related subjects.\* Students are normally required to complete a course of study worth at least five (5) credits. Such a course may include classes, seminars, preparation of fields of study, comprehensive



examinations, demonstrations of foreign language proficiency, a thesis, and oral defence of the thesis. Some departments may require course work in excess of five (5) credits.

Advanced classes normally included in the Master's course, completed before admission, may be presented at the time of admission as part of the requirements, provided that they have not been counted for another degree.

One full year of resident study at Dalhousie University is a minimum requirement for the Master's degree. Course requirements for the degrees MAT, MBA, MED, MDE, MHSA, MLIS, MN, MPA, MSW, LLM, JSD, and MSc in Oral and Maxillofacial Surgery are described in the department entries in the next section.

\*Except interdisciplinary programmes in African Studies, Environmental Studies and Neuroscience.

### 10.3 Course Requirements for the PhD Degree

A candidate must demonstrate the ability to carry out research of high quality leading to an advance of knowledge in his/her area of study. In general, at least two (2) years must be spent in full-time study on the Dalhousie campus. The candidate's course of study will be initiated with the advice of a supervising committee of at least three (3) members. The thesis and course of study will be directed by a committee consisting of the research supervisor and at least two (2) other members. The course of study must include a preliminary examination (to be taken not less than one (1) year before submission of the thesis) and preparation and oral defence of a thesis. The course of study may include classes, seminars, comprehensive examinations, qualifying examinations, preparation of fields of study, demonstrations of foreign language proficiency, and any other requirements considered necessary for the clear demonstration of post-Master's-level comprehension, scholarship, and ability in the candidate's particular area of study.

Candidates for graduate degrees may be required to engage in teaching duties. These duties will conform to the requirements of the Departments and usually will not involve more than ten hours teaching and preparation per week.

Residency requirements must be fulfilled before a degree can be conferred.

## 11. Classes, Theses, Examinations

Classes may be full or half year (full or half credit respectively) and may be designated by the candidate's committee as "Required" (pass mark B-) or "Ancillary" (normal undergraduate pass mark).

**Ancillary:** Classes which a department recommends as advisable additional background to the degree programme, but not specifically required for that programme, are termed ancillary classes and must be taken in a department other than the one in which the student is registered. The pass grade in these is the same as for the undergraduate faculty unless otherwise specified by the department.

**Audits:** Students may take one audit for each year of residency fee requirement in their programme. Audits must be listed on the Programme of Graduate Studies form.

**Examinations** will normally be the method of grade assessment in graduate classes. There are no supplementary examinations.

**Pass Standard:** 1) Graduate students must achieve a minimum, or passing, grade of "B-" in all classes required of their degree programme, except those in programmes listed in 2) below. Any lower grade will be recorded as a failure. A student who fails to meet these requirements in any year is automatically withdrawn (academically dismissed) from the programme. However, such a student may apply to the department for readmission.

2) In the following programmes, Business Administration, Health Services Administration, Library and Information Studies and Public Administration full-time students are allowed one failing grade. However, no credit will be granted for the failing grade and the class must be repeated and a grade of "B" or better obtained. (Failed core classes must be repeated, electives may be repeated or replaced at the discretion of the department).

A student who fails to complete the required work for a particular class during the normal period of the class will receive a grade of "F." However, where circumstances warrant it, a grade of "Incomplete" may be assigned. Subsequent completion of the work following the end of the class may result in a change of grade, as long as the work is completed before the following deadlines:

**Full Year classes:** May 31, or 8 weeks after the end of the class, whichever is the longer period.

**A/B classes:** January 31/May 31, or 8 weeks after the end of the class, whichever is the longer period.

**Summer classes:** July 31 (Spring session) and September 1 (Summer session), or 4 weeks after the end of the class, whichever is the longer period.

After these deadlines, an "Incomplete" grade cannot be changed and will appear on the official academic record of the student.

The grade of "In Progress" may be used only to report thesis classes and those designated as "open to independent completion of study."

**Withdrawal From Classes:** The final date for withdrawal from classes shall be: for 'A', 'C', 'R' classes - 22 October, for 'B' classes - 11 February; for summer session classes - the mid-point of the class. For withdrawals before these dates, the class and the withdrawal is not recorded on the academic record. After these dates, the student is responsible for the content of the class and receives a grade for it. Students must complete the appropriate registration change form, which must be approved by the instructor concerned.

**Preliminary Examination of PhD candidates** is conducted not less than one (1) year before the candidate submits a thesis. The examination may be oral, written, or both, at the discretion of the Department concerned, and will cover subjects relevant to the general area of the candidate's research. Failure to pass the examination may result in dismissal. However, the student may be permitted to repeat the examination within the subsequent twelve (12) months.

**Comprehensive Examinations** in the candidate's area of study are part of both Master's and PhD degree courses of study in some Departments. Refer to particular departmental entries for details. It is the responsibility of Departments to make the necessary arrangements for these examinations.

**Foreign Language Proficiency** is required of candidates by some departments. Refer to particular departmental entries for details.

**Theses:** PhD and Master's theses must display original scholarship expressed in satisfactory literary form consistent with the discipline concerned and be of such value as to merit publication. The subject of the PhD thesis must be approved by the Faculty at least twelve (12) months before the date of final examinations. Theses will normally be graded as "Approved" or "Not Approved."

**Oral Defence** of the thesis is required by some Departments of Master's degree candidates. Refer to particular departmental regulations. A public defence of the PhD thesis is required, see 12.2 below.

**Credits** may be given for classes, seminars, comprehensive examinations, preparation of fields of study, foreign language proficiency, a thesis, etc., at the discretion of the Department. A Master's-level thesis is not usually worth more than two (2) credits.

## 12. Regulations for Thesis Preparation

### 12.1 Presentation for Examination

Theses for the Master's degree must be presented to the Department for examination not later than March 25, for Spring Convocation, or August 31, for the Fall awarding of degrees. Five (5) unbound copies are required (original and four copies).

### 12.2 Regulations For Oral

#### Examination of a Doctoral Candidate

#### Procedures

1. The candidate shall register the proposed title of the thesis with the Faculty of Graduate Studies, no later than six months before submission of the completed thesis.
2. The Chairperson of the Department shall recommend to the Dean or Associate Dean of Graduate Studies one name (with c.v.), from a list of three names submitted by the thesis supervisor for the appointment of an external examiner at least three months before the anticipated date of completion of the thesis. These persons suggested should be acknowledged experts in the field or discipline of the research being examined in the thesis. Initial contact with the external examiner should be made by the Chairperson of the Department.
3. Of the five copies of the thesis required, the candidate shall submit one unbound copy of the completed thesis (the External Examiner's copy) to the Faculty of Graduate Studies, together with the Thesis Submission Form. The deadlines for submitting unbound PhD theses to departments (see the Almanac in the Faculty of Graduate Studies calendar under August, November and February) are also the deadlines for submission of the one unbound copy (with completed Thesis Submission Form) to the Faculty of Graduate Studies office (see also item 6 below). This copy is then sent to the External Examiner by the Graduate Studies office. At that time the candidate shall normally provide a brief abstract of the significant findings, no longer than 300 words, suitable for publication in a public notice of the defence.
4. The other four copies of the thesis will be submitted by the candidate to the departmental graduate coordinator, who will distribute them immediately to local members of the examining committee. One copy may be held in the

- departmental secretary's office for use by other interested faculty and students.
5. No arrangements will be made for the oral examination until all of these requirements are fulfilled. The examination will be held no earlier than four weeks after submission of the thesis, thereby allowing adequate time for the thesis to be read by the external examiner.
  6. The Dean or Associate Dean of Graduate Studies will issue a formal invitation to the external examiner and will send a copy of the thesis (see paragraph 3) to him at least four weeks before the examination.
  7. In consultation with the Chairperson of the Department, the graduate co-ordinator, and the research supervisor, the Faculty of Graduate Studies office will establish a time and place for the examination.
  8. The external examiner will normally submit by mail a constructively critical and analytical report to the Associate Dean of Graduate Studies, who will send a copy to the graduate co-ordinator. Normally the external examiner will attend the defence, but in the rare event of the external examiner not attending, the written report should be submitted to the Assistant Dean one week before the defence.
  9. Notice of the public defence of the thesis will be published and sent to all relevant departments by the Faculty of Graduate Studies. All interested faculty, students, and members of the public will be welcome to attend.
  10. Variation of the regulations outlined above may be permitted only with the written permission of the Dean of Graduate Studies.

### Oral Examination

The oral examination of a doctoral thesis is the culmination of the candidate's research programme. It exposes the work to scholarly criticism and gives to the candidate the opportunity to defend the thesis. It is only fitting that the examination should be a public defence before the members of Faculty and other interested persons. The Examination is chaired by the Dean or Associate Dean of Graduate Studies or a member of the Panel of PhD Defence Chairs. The examining committee consists of the chairperson of the department concerned (or a designate), and at least four additional members, one of whom shall be the external examiner from outside the University.

The candidate is questioned on the thesis following a summary presentation no longer than 20 minutes. The Chairperson will

give priority to questions from the external examiner and from the other members of the examining committee in some pre-arranged order. The audience will then be invited to ask questions. The Chairperson adjourns the examination when the examining committee decides that further questioning is unnecessary. He/she then chairs the examining committee during its deliberations *in camera*. The decision of the examining committee is based both on the thesis and the candidate's ability to defend it.

No thesis shall be approved without the agreement of an external examiner, except that a negative opinion of an external examiner who does not attend the examination should not prevail over the unanimous opinion of the other examiners present and voting.

The thesis is graded "approved" or "not approved". A thesis can be accepted by the Examining Committee as submitted; accepted on condition that specific corrections are made; rejected with permission to submit a revised thesis; or rejected. It should be stressed that theses can be rejected on grounds of form as well as content.

If specific corrections are required, the thesis will be returned to the candidate and a time limit during which the corrections must be completed will be decided upon by the examining committee. All corrections and revisions should be made with the same kind of type as used in the thesis. Insertions by pen are not acceptable. If the corrections and revisions require additional pages, the numbering of the pages has to be changed so that all pages are numbered consecutively. Specific corrections will be left to the satisfaction of the local committee and research supervisor.

If the thesis is rejected with permission to submit a revised thesis, the revised thesis will be re-read by an examining committee, at least two of whose members were on the original committee. The thesis shall be submitted to an external examiner who may be the original external examiner if the Associate Dean of Graduate Studies considers this to be desirable. The candidate shall defend the thesis before an examining committee in the usual way.

In situations where a thesis has been failed and is judged to have been unfairly assessed, an appeal may be made to the Dean or the Associate Dean of Graduate Studies by the candidate or, on behalf of the candidate, by the research supervisor or Chairperson of the Department. If the evidence presented appears sufficiently strong, the Dean shall initiate the procedure for a re-examination as outlined above. No more than one such appeal shall be

entertained, and the Dean's judgement shall be final. There are no third chances.

The recommendation for degree must be approved by the Faculty of Graduate Studies and by the Senate.

Variation of the procedures stipulated above may be permitted only with the written permission of the Dean of Graduate Studies.

**Panel of PhD Defence Chairs**

- D.R. Arnold, Chemistry
- A.J. Bowen, Oceanography
- M.S. Cross, History
- M.W. Gray, Biochemistry
- B.K. Hall, Biology
- W.F. Hare, Education/Philosophy
- D.A. Hopkins, Anatomy
- R.A. Jamieson, Geology
- R. Klein, Psychology
- C.B. Lazler, Biochemistry
- K.T. Leffek, Chemistry
- H.A. Robertson, Pharmacology
- A.M. Sinclair, Economics
- P.N. Stewart, Math. Stats. & C.S.
- A.C. Thompson, Math, Stats. & C.S.
- J.A. Wainwright, English
- J.H.M. Willson, Associate Dean - Coordinator

**12.3 Preparation of Manuscript**

Theses manuscripts must be prepared in accordance with Faculty of Graduate Studies rules. Detailed instructions may be obtained from the Faculty Office (Room 314, Arts and Administration Building).

**12.4 Binding**

At the time of submitting unbound thesis (original and four copies) to the Graduate Studies Office, students will present a cheque for \$70.00\* payable to the Faculty of Graduate Studies, Dalhousie University. This sum will cover the cost of binding.

The Faculty Office will arrange for the binding and subsequent distribution of theses as follows:

- (a) One (1) copy is sent to the author.
- (b) Two (2) copies are sent to the student's Department.
- (c) Two (2) copies are sent to the University Library which arranges for the production of microfilm copy to be retained in the National Library, Ottawa. The National Library can then circulate such copy according to the International Inter-Library Loan Code, with full copyright protection; it also guarantees a permanent record of the thesis. The University Library retains one (1) bound copy in the University Archives.

\* Subject to change without notice.

the Department, School or College, then, if necessary, the Dean. If still unresolved, the student may appeal to the Academic Appeals Committee of the Faculty of Graduate Studies.

**Scholarships, Fellowships, and Financial Assistance**

Please note that the contents of this awards section are subject to change without notice. The University reserves the right to publicize the recipients of merit awards.

**Graduate Scholarships and Fellowships (a) General Disciplines**

**Dalhousie Graduate Scholarships:** Dalhousie graduate scholarships are offered in the various fields of the liberal arts, science and interdisciplinary studies.

Applications for scholarships must be made on the form "Application for Admission" which is obtainable from the Registrar. Graduate scholarships are awarded only to students pursuing a degree programme on a full-time basis. A student may register full-time and hold a job simultaneously only if the job involves not more than 10 hours work per week. Scholarships are not offered to anyone on leave from a job with salary continuation. In order to be eligible for a Dalhousie Graduate Scholarship, a student is expected to hold at least the equivalent of a Dalhousie honours degree in an appropriate field of study. Those wishing to be considered for scholarship assistance are advised to submit their applications no later than March 1.

In general, the Dalhousie Graduate Scholarship will be paid to the student in regular monthly payments on the 27th of each month, after University fees have been deducted. Cheques are available from the Office of the Dean of Graduate Studies, Rm. 314, Arts & Administration Building upon presentation of a current valid Dalhousie Student Identification card. Students who are in receipt of an award but are pursuing some part of their programme off campus at the request of their department must apply to their department for permission to have alternate arrangements made for payment of the award.

Applicants for graduate scholarships should write to the head of the department concerned in addition to making their official application to the Registrar.

Very well qualified scholars who receive awards from federal agencies may also receive Dalhousie supplements within the limits set down by the agencies offering the awards.

**The Isaac Walton Killam Memorial Scholarships:** Shortly before her death, Mrs. Dorothy J. Killam set aside a substantial portion of her estate for

**13. Appeals**

All faculty regulations are subject to the normal appeals procedure which begins with

the purpose of founding the Izaak Walton Killam Fund for Advanced Studies at Dalhousie University.

Her purpose in so doing was not only to establish a perpetual memorial in his native province to her late husband, Izaak Walton Killam, industrialist and financier, but also "to help in the building of Canada's future by encouraging advanced study." It was her hope that she might thereby in some measure "develop and expand the work of Canadian Universities, and promote sympathetic understanding between Canadians and the people of other countries." It is in accordance with Mrs. Killam's wishes that Dalhousie University offers the Izaak Walton Killam Memorial Scholarships.

Killam scholars are selected on the basis of nominations made by departments. It is expected that nominees will also have applied for funding from relevant national or international agencies. Canadian students are eligible for nomination for the Killam Scholarships only if they have applied for the relevant national scholarship (NSERC, SSHRC, MRC, etc.).

Only those students registered in a programme with a thesis requirement are eligible to hold the Izaak Walton Killam Memorial Scholarship.

Scholarships may be renewed annually upon evidence of satisfactory completion of work leading toward the Master's or Doctoral degree, subject to the following maxima; Masters students may hold a Killam Scholarship for up to 24 months and PhD students for up to 36 months, plus reconsideration in the general competition for a further 12 months (maximum 48 months). The scholarships are valued at \$14,000 (1990-91) for a Masters programme and \$15,000 (1990-91) for a Doctoral programme. No remission of fees accompanies the scholarships, but additional funds to assist with transportation to Halifax will be supplied. Killam scholars may perform instructing or demonstrating duties, but, if they do, will be given additional remuneration for these services.

Killam scholarships are open to both Canadians and non-Canadians. Please note that candidates do not apply for these Scholarships. On the basis of the information in a completed application for admission the graduate department concerned may nominate the student to the selection committee. Applications for admission to the University for Graduate Studies are available from the Office of the Registrar, Dalhousie University, Halifax, NS, B3H 4H6.

**The Izaak Walton Killam Postdoctoral Fellowships:** Killam funds also provide for a small number of postdoctoral fellowships. The annual stipend is \$29,000 (1991-91), plus travel grants. There are no restrictions regarding the discipline of study or the nationality of applicants, but non-Canadian candidates must meet all Canadian immigration requirements. Qualifying applicants

should have recently completed a PhD degree at a recognised university and should not hold a permanent academic position to which they will return. Since these Fellowships are intended to attract new scholars to Dalhousie, scholars already at Dalhousie are not eligible to apply, including Dalhousie PhDs, Dalhousie or King's employees, and researchers using Dalhousie or King's facilities. These awards may be taken up between July 1st 1992 and January 15th 1993, but preferably in September or October 1992. Fellows may engage in limited teaching duties in the University. A graduate seeking a Killam Memorial Postdoctoral Fellowship must contact the appropriate Dalhousie department and indicate the scholar or researcher with whom s/he wishes to work or be associated by October 15, 1991, enclosing a c.v. and a brief description of the proposed research. Prospective applicants with suitable research proposals will be invited to apply on forms mailed to them, which should be returned, with supporting documents, no later than December 15, 1991 to the Dean of Graduate Studies, Dalhousie. The results of the competition are usually announced in mid-February, and all applicants are notified of the results.

### (b) Specific Disciplines

#### **Business Administration**

**Goldberg-Schmlich Award for Entrepreneurship:** The Nevada Capital Corporation in 1984 donated the sum of \$29,000 to establish an award in memory of Meyer Goldberg of Halifax, N.S. This award is available to a student entering the second year of Dalhousie University's MBA programme.

**The Scotiabank Scholarships:** The Bank of Nova Scotia has established at Dalhousie University two scholarships valued at \$12,500 each. These are open to Canadian and Caribbean citizens and permanent residents who fulfil the normal requirements for admission to the Faculty of Graduate Studies and to the MBA programme. Candidates will be well-rounded individuals with a clear record of outstanding scholastic achievements during undergraduate studies. The awards are renewable contingent upon maintaining a high level of scholastic achievement and continuing full-time studies in the programme. Applications for Scotiabank Scholarships are available from Graduate Admissions, Dalhousie University, Halifax, N.S., B3H 4H6. Completed applications are to be received no later than 15 April. Please note that the MBA programme application must also be completed by the same date.

**The Department of External Affairs Fellowships in International Business:** Fellowships of \$3,000 to \$4,000 per annum are awarded to full-time second-year students specializing in the field of International Business. Candidates must be Canadian citizens or permanent residents, and

have a strong academic record. Fellowship recipients will be selected on the basis of a career interest in international business and academic performance to date. For further information contact the Centre for International Business Studies, School of Business Administration.

### English

**C.L. Bennet Memorial Scholarship:** The Department of English has designated that one University scholarship in the amount of \$500 be awarded annually as a memorial to the late Professor of English, Dr. C.L. Bennet. This award will be made to an outstanding graduate of a Maritime or Newfoundland university (other than Dalhousie) who wishes to pursue an MA in English at Dalhousie. Eligible students should apply for Graduate Study in English in the usual way, by March 31st, indicating a desire to be considered for the Bennet award. Further details available from the English Dept.

**The James W. Tupper Graduate Fellowship in English:** This fellowship, of an annual value of approximately \$5,500 is awarded by the faculty of the Department of English to a student who proposes to do graduate work in English at a university approved by the faculty. The award need not be held at Dalhousie. Further information may be obtained from the Department of English.

### Environmental Studies

**The Gerald and Margaret Godsoe Scholarship:** This scholarship has been established by the Godsoe family to support a highly qualified and motivated individual entering the Master of Environmental Studies (MES) programme at Dalhousie. The recipient must hold an honours degree in natural or social sciences, engineering, architecture or its equivalent, and have first class standing in his/her course of study or have proof of exceptional merit. Further, the recipient must have made significant contributions through community service, leadership, and education on environmental issues. Eligibility is limited to Canadian citizens and permanent residents of Canada living in the country. The award is valued at \$10,000 per year and may be renewable. The recipient will be selected by the Admissions Committee at the School for Resource and Environmental Studies. Additional information about application procedures is available from the School for Resource and Environmental Studies.

### Library and Information Studies

**The H.W. Wilson Scholarship:** Sponsored by the H.W. Wilson Foundation, the scholarship, valued at \$1,000 US, is intended to attract exceptional young men and women who would not otherwise be able to make librarianship the choice for a career. Apply to the Director, School of Library & Information Studies, Dalhousie University.

### Oceanography

**The Professor F. Ronald Hayes International Scholarship:** This scholarship fund was established in memory of Professor F. Ronald Hayes, founder and first director of the Institute of Oceanography of Dalhousie University, and in commemoration of the Joint Oceanographic Assembly which was held at Dalhousie during August 1982. The purpose of the scholarship is to provide financial support for a new graduate student in the first year of an MSc or a PhD programme in the Department of Oceanography. The recipient must be from a developing country, as stipulated in the terms of reference, and will be nominated through the normal screening process by the Departmental Graduate Admission Committee. For further information contact the Department of Oceanography.

### Oral and Maxillofacial Surgery

**John P. Laba Memorial Research Award:** The income, earned from a fund established in memory of John P. Laba by family, friends, patients and colleagues, will provide for this award which may be given annually. The recipient will be the dentist accepted in the Graduate Programme in Oral and Maxillofacial Surgery and will be given exclusively for the presentation, dissemination and/or publication of research related to Oral and Maxillofacial Surgery. For further information please contact the Department of Oral and Maxillofacial Surgery.

### Pharmacy

**The Parke, Davis Pharmacy Research Fellowship:** Parke, Davis Canada Inc. annually sponsors a fellowship of \$2,000 to a graduate student in the College of Pharmacy. For further information contact the College of Pharmacy.

**The Novopharm Pharmacy Research Fellowship:** Novopharm Limited sponsors an annual fellowship of \$500 to a graduate student in the College of Pharmacy who demonstrates superior research achievements in biopharmaceutics or drug metabolism. For further information contact the College of Pharmacy.

### Physics

**The William Leiper Memorial Scholarship:** An endowment has been established to provide an annual scholarship to a deserving graduate student in physics. Awarded at the discretion of the Physics Department, the scholarship is normally granted to a student already engaged in graduate study at Dalhousie.

**The James Gordon MacGregor Memorial Teaching Fellowship in Physics:** One fellowship of the value of \$2,500 is offered. To be eligible, the candidate must have the necessary qualifications for admission to the Master's

programme in Physics. The holder of this fellowship is expected to give instruction in the laboratory during the academic session. Nominees will be selected by the Department from those who apply for Dalhousie Graduate Fellowships; no separate application is necessary.

**The Dr. A. Stanley MacKenzie Teaching Fellowship in Physics:** One fellowship of the value of \$600 is offered. To be eligible, the candidate must have the necessary qualifications for admission to the Master's programme in Physics. The holder of this fellowship is expected to give instruction in the laboratory during the academic session. Nominees will be selected by the Department from those who apply for Dalhousie Graduate Fellowships; no separate application is necessary.

### Psychology

**The Dr. Mabel E. Goudge Scholarship in Psychology:** In her Will the late Dr. Mabel Goudge bequeathed a sum of money with which to endow scholarships to qualifying graduate psychology students at Dalhousie. The scholarship in graduate studies is restricted to experimental or clinical psychology. For further information contact the Department of Psychology.

### (c) Of Interest to Women

**Eliza Ritchie Doctoral Scholarship for Women:** The Eliza Ritchie Doctoral Scholarship has been established to commemorate Women's Centennial Year and to recognise the contribution to Dalhousie of one of its most important nineteenth-century graduates. After completing her undergraduate studies at Dalhousie in 1887, Eliza Ritchie (1856-1933) became one of the first Canadian women to receive a PhD degree (Cornell University, 1889). She cut short her professional career at Wellesley College to return to Halifax in 1899, where she devoted her energies to feminist and cultural causes, and to Dalhousie, for the rest of her life. She was the first warden of a Dalhousie women's residence (Forrest Hall, 1912-13), the first woman to serve as a member of the Dalhousie Board of Governors (1919-25), a founding member of the editorial board of the Dalhousie Review, and the first woman to receive an honorary degree from Dalhousie (LLD, 1927). Scholarships will be awarded to Canadians and permanent residents only and preference will be given to candidates from the Atlantic Provinces. Among such applicants preference will be given to those in disciplines in which women are under-represented. The award will have a value of \$15,000 (1990-91) for a 12-month academic period at Dalhousie. One scholarship may be awarded each year. The deadline for the receipt of the prescribed applications is 1st March. Additional information and application forms are available from the Faculty of Graduate Studies, Dalhousie University.

### Bursaries

#### (a) General Studies

**The John and Lina Graham Commonwealth Bursary:** The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. The net annual income may be used to assist one or more graduate students who find themselves in need of financial aid while in Nova Scotia. Recipients will be residents of Commonwealth countries, other than Canada, who in the opinion of the selecting body demonstrate need.

#### Teaching Assistantships

Some departments may offer Teaching Assistantships. The number, amounts and conditions vary. Please enquire of your department or school.

### Interdisciplinary Studies

#### Interdisciplinary PhD Programme

See main entry in this calendar.

### African Studies

The Centre for African Studies serves to promote African studies and to provide for cross-disciplinary interaction both at the undergraduate and graduate level. At the graduate level, the responsibility for the student's programme rests with the Department concerned, although, with the consent of the Department, it may include one or more classes from another discipline.

One of the functions of the Centre is to organize an interdisciplinary senior seminar. This is a research-oriented seminar open to faculty, graduate students, and senior undergraduate students of the participating Departments. These Departments are Economics, English, History, Political Science, and Sociology and Social Anthropology.

### Neuroscience

The University offers a graduate programme leading to an MSc or PhD degree with a specialization in Neuroscience. See main entry in this Calendar.

### School for Resource and Environmental Studies

The School offers a graduate programme leading to the Master of Environmental Studies (MES) degree. See main entry in this Calendar.

### Joint Programmes

#### MBA/LLB

A four-year programme leading to degrees of Bachelor of Laws and Master of Business Administration. Normally students will register

for Graduate Studies/MBA in the first year of the programme and Faculty of Law/LLB in the subsequent three years.

Students must apply to both the Law School and the School of Business Administration individually, satisfying the entrance requirements for both programmes.

For further information see entry for Business Administration on page 56.

### **MPA/LLB**

A four-year programme leading to degrees of Bachelor of Laws and Master of Public Administration. Normally students will register for Graduate Studies/MPA in the first year of the programme and Faculty of Law/LLB in the subsequent three years.

Students must apply to both the Law School and the School of Public Administration individually, satisfying the entrance requirements for both programmes.

For further information see entry for Public Administration on page 128.

### **MD/PhD**

The combined programme is offered to students as a means of expanding career opportunities and to contribute to the training of a new generation of scientifically trained clinical research workers.

The programme will be offered in the following Faculty of Graduate Studies departments: Anatomy, Biochemistry, Microbiology, Pharmacology and Physiology/Biophysics.

Students must apply to both programmes in the same year (satisfying the entrance requirements in both Faculties). The student will register for the first two years of the combined programme full time MD and part time PhD (paying fees for the MD programme only). In the third and fourth years the student will register full time PhD paying full graduate studies fees, devoting all of his/her time to the PhD programme. In the following years, until completion of the MD, the student will register full time MD and part time PhD (paying only MD fees). If the student completes MD before completing PhD he/she must register with the Faculty of Graduate Studies paying an appropriate fee.

## **Departmental Listings**

The following entries are designed to provide information about particular graduate programmes. Although general Faculty of Graduate Studies requirements apply to all graduate programmes, the methods of fulfilling these requirements vary considerably among Departments.

Each Departmental entry includes the following information:

1. A list of faculty members engaged in the teaching of graduate classes and/or the direction of graduate research. Faculty members whose major appointments are in other Departments are so indicated. In addition, the names of other teachers and/or researchers in the Department may be listed.
2. A description of facilities available may be included. Some general regulations may be described.
3. A list of admission requirements in addition to those of the Faculty of Graduate Studies. In some cases the minimum requirements outlined in Section 2 are not sufficient for entry into a particular programme. Other particular requirements may be listed.
4. A description of degree programme requirements broken down into five categories:
  - (a) Minimum time required to complete the programme.
  - (b) Coursework required.
  - (c) Other academic requirements.
  - (d) Thesis requirement.
  - (e) Other requirements.
5. A representative list of class offerings. Not all of the classes will necessarily be offered in a given year. In all cases where a letter appears after a class number in this calendar it should be understood as follows:
  - A after the class number denotes a single-term class offered in the fall term only
  - B after the class number denotes a single-term class offered in the spring term only
  - A/B denotes a single-term class which students may take in either fall or spring term
  - C after the class denotes a half credit class lasting both fall and spring terms
  - R denotes a class lasting both fall and spring terms. It usually - though not necessarily - carries one full credit.
6. An extensive list of areas of specialization.
7. A list of departmental brochures or publications relating to graduate study.



**Anatomy**

Location: Sir Charles Tupper Medical Building  
Halifax, N.S. B3H 4H7  
Telephone: (902) 494-2051

**Head of Department**

D.G. Gwyn, MB, BS, LRCP (Lond.), MRCS  
(Eng.), PhD (Birm.), Campbell Professor

**Professors**

D.M. Chapman, MSc (Man.), PhD (Cantab.)  
D.H. Dickson, BA, MSc, PhD (W.Ont.)  
D.A. Hopkins, BSc (Alta.), MA, PhD (McMaster)  
R.J. Wasservug, BSc (Tufts), PhD (Chicago)

**Associate Professors**

J.R. Asuncion, Jr., MD, CM (Santo Tomas), AA  
(Philippines)  
R.E. Clattenburg, BSc, MSc (Acadia), PhD  
(W.Ont.)  
R.W. Currie, BSA, MSc, PhD (Man.)  
M.M. Hansell, BSc (Tor.), PhD (Calif.)  
I.G. Mobbs, BSc (Aberdeen), MSc (McMaster),  
PhD (W.Ont.)  
J.C. Penney, MSR, FSR, TE (Lond.)  
J.G. Rutherford, BA (Cornell), MS (Syracuse),  
PhD (SUNY)  
K. Semba, B.Ed, MA (Tokyo), PhD (Rutgers)

**Assistant Professors**

P.C. Jackson, PhD (McMaster)  
W.B. Mathieson, MSc (Carleton), PhD (Ottawa)  
F.M. Smith, BSc, PhD (UBC)

**Instructor**

C. Marshall, MD, BSc, MSc (Dal)

The Department of Anatomy provides facilities for advanced study and research in Neuroscience, Histology, Embryology, Neuroendocrinology and Evolutionary Biology.

**Admission Requirements**

All general requirements for admission to the Faculty of Graduate Studies must be fulfilled. In addition, applicants are expected to have received a sound training in biology and chemistry.

Candidates entering with the minimum qualifications (a 4 year BSc) will be registered in a 2 year MSc programme. Honours students in biology with excellent qualifications usually register in an MSc programme but, after 1 year, may transfer to a PhD programme. Recommendation for such a transfer, from the masters to the PhD programme, must come from the student's advisory committee and be based upon excellence in course work and research potential. Applicants holding a Master's Degree in a biological science may apply for direct admission into a PhD

programme. Medical graduates with an aptitude for research may apply for admission to the MSc or PhD programme.

Applicants holding a 3-year BSc degree will be required to complete a qualifying year before being admitted into a graduate programme. The content of this year of study will be recommended by the Department of Anatomy Graduate Studies Committee.

**MSc Degree Programme**

The minimum residency requirements for the MSc degree are as indicated in Section 6. of the Faculty of Graduate Studies Calendar.

A minimum of five graduate-level credits is required. A written thesis reporting original research must be submitted and defended orally. The MSc thesis (Anatomy 9000) may count for up to three of the five graduate level credits required for the degree. All MSc candidates must participate in the departmental seminar programme during each year of training. Classes are determined by consultation between the student, research supervisor and the Department of Anatomy Graduate Studies Committee. For each candidate, classes will be selected from those listed below or, where appropriate, from those offered by other Departments. Consent of the instructor is required for admission into each class. Normally, 24 months (2 years) are necessary to complete all requirements for the MSc degree.

All MSc candidates must assist in laboratory teaching or an equivalent (approximately 40-50 hours) during each year of residency.

Financial assistance is normally available for no more than two full years.

**PhD Degree Programme**

Residency requirements for the PhD degree are summarized in Section 6. of the Graduate Studies Calendar.

The course requirements for each PhD candidate are determined by consultation between the student, the research supervisor and the Department of Anatomy Graduate Studies Committee. All PhD candidates must participate in the departmental seminar programme during each full year of training. The student is also required to assist in laboratory teaching (approximately 40-50 hours per year for at least two years) and to deliver 4-6 hours of lectures during the course of his/her training.

A written thesis (Anatomy 9530) based on original research of a high calibre must be submitted and defended orally.

Financial assistance is normally available for no more than four years.

**Preliminary Examination:** All PhD candidates must pass a preliminary examination no later than 1 full year prior to the submission of a thesis (see Section 11). The examination will include material related to the general and specific areas of

research. The examining committee will be selected by the Department of Anatomy Graduate Studies Committee after consultation with the candidate's research supervisor and will conduct the examination in accordance with the regulations established by the Department of Anatomy. **Theses Examinations:** MSc and PhD theses will be defended in accordance with the regulations of the Faculty of Graduate Studies (see Sections 12.1 and 12.2).

### Combined MD/PhD Programme

For information on the combined MD/PhD programme see "Joint Programmes" (page 47.)

### Classes Offered

**ANAT 503R Human Histology:** one credit, co-ordinator M.M. Hansell

**ANAT 504R Microanatomical Techniques:** one credit, co-ordinator W.B. Mathieson

**ANAT 505C Seminar:** half credit, co-ordinator Staff

**ANAT 507B Chemical Neuroanatomy:** half credit, co-ordinator K. Semba

**ANAT 509B Cellular Development in the Nervous system:** half credit, co-ordinator P. C. Jackson

**ANAT 510R Neuroanatomy:** one credit, co-ordinator J.G. Rutherford

**ANAT 512R Human Embryology:** one credit, Prerequisite: Anatomy 515C and 516R, an equivalent or the consent of the instructor. Co-ordinators: D.M. Chapman, M.M. Hansell

**ANAT 515R Head and Neck:** one credit, co-ordinator D.G. Gwyn

**ANAT 516R Gross Anatomy:** one and one-half credits, co-ordinator R.W. Wassersug

**ANAT 517C Special Topics:** half credit, co-ordinator arranged according to research topic

**ANAT 9000 MSc Thesis**

**ANAT 9530 PhD Thesis**

## Biochemistry

**Location:** Sir Charles Tupper Medical Building

5859 University Avenue  
Halifax, N.S. B3H 4H7

**Telephone:** (902) 494-2480

**Fax:** (902) 494-1355

### Head of Department

W. Carl Breckenridge, Carnegie and Rockefeller Professor

### Professors

A.H. Blair, MSc (UBC), PhD (Calif.) - Graduate Coordinator (Telephone: 494-2407)

W.C. Breckenridge, BSc (Kingston), MSc, PhD (Tor.)

R.W. Chambers, BA, PhD (Calif.) (post-retirement)

P. J. Dolphin, BSc, PhD, DSc (Southampton)

W.F. Doolittle, AB (Harv.), PhD (Stan.)

M.W. Gray, BSc, PhD (Alta.)

C.W. Helleiner, BA, PhD (Tor.)

C.B. Lazier, BA (Tor.), MSc (UBC), PhD (Dal)

C. Mezel, Dipl.Pharm.(Hung.), MSc, PhD (UBC)

F.B. Palmer, BSc, PhD (W. Ont.)

D.W. Russell, B.Pharm. PhD, DSc (Lond.), BEd (Dal)

R.A. Singer, AB (Princeton), PhD (Harv.)

M.W. Spence, MD (Alta.) PhD (McG.) (Major appointment in Paediatrics)

M.H. Tan, BSc, MD (Dal), FRCP(C), FACP (Major appointment in Medicine)

S.D. Wainwright, BA (Cantab.), PhD (Lond.)

J.A. Verpoorte, Drs (Utrecht), DSc (Pretoria)

### Associate Professors

H.W. Cook, BSc, MSc (McG), PhD (Dal) (Major appointment in Paediatrics)

E.A. Faust, BSc, PhD (McGill)

F.I. Maclean, MA (Tor.), DPhil (Oxon.)

C.J.A. Wallace, MA, DPhil (Oxon)

### Assistant Professors

D.M. Byers, BSc, MSc (Dal.), PhD (Alta.) (Major appointment in Paediatrics)

D.E.C. Cole, BSc, MD (Tor), PhD (McG) (Major appointment in Paediatrics)

P.X-Q. Liu, BSc (Wuhan), PhD (Cornell)

H.-S. Ro, BSc, PhD (McMaster)

C.G. Waghorne, BSc (Guelph), PhD (Tor.) (Joint appointment in Pathology)

### Lecturers

S.S. Reddy, BS, MD (Memorial), FRCP (C) (Major appointment in Medicine)

D.C. Riddell, BSc, PhD (Kingston) (Major appointment in Pathology)

**Admission Requirements**

General requirements for admission to the Faculty of Graduate Studies are given in section 2. In addition, foreign applicants must submit the results of the Graduate Record Examination. A score of at least 550 on the TOEFL is required of applicants whose native language is not English (section 2).

**General Regulations**

General Faculty requirements are given in sections 10. - 12. In the course of their studies, students develop a firm grasp at an advanced level of one of three specialties: molecular biology, lipid biochemistry (membranes, lipid and lipoprotein metabolism) or protein biochemistry. Students without an honours BSc or MSc in biochemistry are assessed early in their programmes to determine their level of basic understanding of the major areas of biochemistry. This allows for planning classes that may be necessary to improve basic knowledge. For all students, the advanced knowledge component is developed by formal classes and/or guided study arranged for each student through consultation with his or her advisory committee. Students also participate in the Biochemistry Seminar series (Biochemistry 5900-5903). A preliminary examination on the subject area of the thesis is taken at the end of the first year of study. Application may be made at that time to transfer from an MSc to a PhD programme. Scholarship support is available and additional information can be obtained by contacting the department.

**MSc Programme**

A thesis describing original research done by the candidate is prepared and defended orally. A Thesis Supervisory Committee consisting of the research director and two others is appointed to assist the candidate.

The minimum residence requirements of the two MSc programmes are 1 and 2 years respectively (see section 6.). Experience has shown that most candidates require an additional 6-12 months to complete the thesis.

**PhD Programme**

The preparation and oral defence of a thesis describing an extensive original investigation carried out by the candidate is the major requirement. A Thesis Supervisory Committee consisting of the research director and three others is appointed to oversee the research.

The minimum times to complete the PhD are 2 years from the MSc and 3 years from the BSc (see section 6.). Most students require an additional year to complete the thesis.

**Combined MD/PhD Programme**

For information on the combined MD/PhD programme see "Joint Programmes" (page 47).

**Areas of Specialization**

Research for graduate degrees may be undertaken in the following fields:

1. Structure, biosynthesis and metabolism of serum lipids and lipoproteins (W.C. Breckenridge, P.J. Dolphin, and M.H. Tan).
2. Metabolic bone disease and the role of inorganic anions in connective tissue metabolism (D.E.C. Cole).
3. Enzymes: mechanism of action and behaviour as targets of chemotherapeutic agents. (A.H. Blair).
4. Control of eukaryotic cell reproduction; the cell cycle (R.A. Singer).
5. Organization, expression and evolution of mitochondrial DNA; ribosomal RNA structure, synthesis and evolution; biochemical mechanisms of transcription and RNA processing (M.W. Gray).
6. Insulin action in skeletal muscle (M.H. Tan).
7. Myelin gene expression in the developing, regenerating and demyelinated peripheral nerve (C. Mezel).
8. Metabolism of physiologically active membrane phospholipids; membrane-bound enzymes of lipid metabolism, local membrane remodelling and bulk turnover in eukaryotic cells in culture. (F.B. Palmer).
9. Molecular biology of biological clocks with special reference to neurohormones in chick pineal gland and retina (S.D. Wainwright).
10. Mechanism of estrogen action: estrogen receptors and gene expression, antiestrogenic drugs (C.B. Lazler).
11. Chemical and physicochemical studies on enzymes and seleno proteins (J.A. Verpoorte)
12. Control of gene expression in prokaryotes; genome structure and evolution of archaeobacteria (W.F. Doolittle).
13. Metabolism of unsaturated fatty acids and membrane phospholipids in cultured cells; relationships to peroxisomal disorders (H.W. Cook).
14. Mathematical programming, game theory and metabolic oscillations (F.I. Maclean).
15. Mutagenesis and carcinogenesis. Nucleic Acid Chemistry. Site-specific mutagenesis. The molecular mechanisms of mutations by carcinogens (R.W. Chambers).
16. Protein engineering by semisynthesis and site-directed mutagenesis. Control and branching of mitochondrial electron transport (C.J.A. Wallace).
17. Mechanism and regulation of fatty acyl transferases and synthetases; bacterial bioluminescence; diseases of intracellular cholesterol metabolism (D.M. Byers).
18. Catalytic mechanisms of lipid metabolizing enzymes (P.J. Dolphin).
19. Enzymology of DNA replication in mammalian cells; DNA polymerase alpha-primease; parvovirus DNA replication (E.A. Faust).

20. Molecular mechanisms of tumour progression and metastasis (C.G. Waghorne).
21. Insulin receptor function and its changes due to membrane alterations (S.S. Reddy).
22. Human molecular genetics (D.C. Riddell).
23. Gene regulation in the biosynthesis of chloroplast and mitochondrial enzyme complexes; structure, function, and evolution of ribosomal proteins (P.X-Q. Liu).
24. Molecular Control of gene expression in human preadipocytes and human obesity (H-S. Ro).

## Classes Offered

Classes marked (\*) are not offered every year. Please consult current timetable.

**BIOC 5000R Special Topics in Biochemistry:** Students interested in topics not covered in formal classes may ask the department for special classes to meet their needs. The fields in which the department can offer instruction may be gauged from the list of research topics.

**BIOC 5300B Biochemical Communication - Membranes, Neurotransmitters and Hormones:** lecture 2 hours, C. Mezel, C. Lazier

**BIOC 5301A Biochemistry of Lipids:** lec 2 hrs, H.W.Cook, F.B.Palmer, P.J.Dolphin, M.W. Spence

**BIOC 5302B Structure, Biosynthesis and Metabolism of Lipoproteins:** lecture 2 hours, W.C. Breckenridge, P.J. Dolphin, J.A. Verpoorte

**BIOC 5304B Integration and Control of Metabolism:** lec 2 hrs, F.L.Maclean/F.B.St.C. Palmer

**\*BIOC 5400R Protein Synthesis and Control Mechanisms:** lecture 2 hours, S.D. Wainwright

**\*BIOC 5401B Transcription and RNA Structure:** lec/sem and guided reading 2 hours, M.W. Gray

**\*BIOC 5402B Biochemical Evolution:** seminar and guided reading 2 hours, W.F. Doolittle

**BIOC 5403A (Microbiology 5403A) Structure, Organization and Replication of Genes:** lecture 3 hours, W.F. Doolittle/M.W. Gray

**BIOC 5404B (Microbiology 5404B) Gene Expression:** lecture 3 hours, H.-S. Ro

**BIOC 5601C and BIOC 5602C Selected Topics in Advanced Biochemistry:** guided reading and tutorial, Biochemistry faculty members.

**BIOC 5603A: Advanced Laboratory in Biochemical Techniques:** Lab: 72 hours total approx. The class will consist of a series of laboratory modules (each of 4 weeks' duration, 6 hours per week) organized collaboratively by the

Departments of Biochemistry, Biology, and Microbiology. Several modules will be offered in 3 sections covering techniques used in the study of molecular biology, protein structure-function, and specific metabolic processes. Graduate students may select their three modules from any section or sections, subject to availability of space. Such students should consult the department regarding prerequisites. Biochemistry, Biology, and Microbiology faculty members. Coordinator for Biochemistry: C.J.A. Wallace

**BIOC 5700A Proteins:** lecture 2 hours, tutorial 1 hour, alternate weeks, J.A. Verpoorte

**BIOC 5701B Enzymes:** lecture 2 hours. Presentations and discussion groups by arrangement. A.H. Blair

**\*BIOC 5800R (Pathology 501) Clinical Medical Biochemistry:** Lecture 2 hours, case studies 1 hour, lab by arrangement. Pathology faculty members.

**\*BIOC 5802R (Pathology 503) Principles of Instrumentation:** lecture 3 hours, lab by assignment, Pathology faculty members

**BIOC 5900-5903 Biochemistry Seminar:** seminars dealing with topics of current interest for Biochemistry graduate students. Coordinator: D.M. Byers

**BIOC 9000 MSc Thesis**

**BIOC 9530 PhD Thesis**

## Biology

**Location:** Life Sciences Centre  
1355 Oxford St.  
Halifax, N.S. B3H 4J1

**Telephone:** (902) 494-3515  
**Fax:** (902) 494-3736

### Chair

R.G. Boutilier

### Professors

R.G. Brown, MSc (McG.), PhD (Rutgers)  
A.R.O. Chapman, PhD (Liv.)  
R.W. Doyle, MSc (Dal), PhD (Yale) Director, Gene Probe Laboratory  
J. Farley, MSc (W.Ont.), PhD (Man.)  
J.C. Fentress, PhD (Cantab.) Major appointment in Psychology  
B. Freedman, MSc, PhD (Tor.)  
B.K. Hall, PhD, DSc (UNE), FRSC  
O.P. Kamra, MS(N.Car. State), PhD(Wash State)  
W.C. Kimmins, PhD (Lond.)

P.A. Lane, MSc (SUNY Binghamton), PhD (SUNY Albany)  
 K.E. von Maltzahn, MS, PhD (Yale), Carnegie Professor, King's College  
 I.A. McLaren, MSc (McG), PhD (Yale), George S. Campbell Professor  
 E.L. Mills, MS, PhD (Yale), Major appointment in Oceanography  
 R.K. O'Dor, PhD (UBC) - Director, Aquatron  
 J.G. Ogden, III, MA (Tenn.), PhD (Yale)  
 D.G. Patriquin, MSc, PhD (McG)  
 D.B. Stoltz, PhD (McMaster), Microbiology Dept.  
 L.C. Vining, MSc (Auck.), PhD (Cantab.), FRSC  
 J.H.M. Willison, PhD (Nottingham)  
 E. Zourou, MSc/PhD(Agr.Col.Athens), PhD(Chic.)

**Associate Professors**

E.W. Angelopoulos, MS, PhD (Minn.)  
 R.G. Boutiller, MSc (Acadia), PhD (East Anglia)  
 G.S. Hicks, MSc (Carl.), PhD (Saak.)  
 R.W. Lee, MA (Mass), PhD (SUNY Stony Brook)  
 T.H. MacRae, MSc, PhD (Windsor)  
 R.P. McBride, MSc (UBC), PhD (Edin.)  
 J.A. Novitsky, BSc (Penn. St.), PhD (Oregon SU)  
 R.E. Scheibling, BSc, PhD (McG)  
 S.R. Shaw, BSc (London), PhD (St. Andrews), Psychology Dept.

**Associate Professor (Research)**

G.F. Newkirk, PhD (Duke)

**Assistant Professors**

A. Pinder, PhD (U. Mass), NSERC Res. Fellow  
 B. Pohajdak, PhD (Manitoba)  
 S. Walde, PhD (Calgary), NSERC Res. Fellow  
 H. Whitehead, MA, PhD (Cambridge), NSERC Res. Fellow  
 J.M. Wright, PhD (Memorial)

**Adjunct Professors**

R.G.S. Bidwell, MA, PhD (Queens), FRSC  
 J.D. Castell, MSc (Dal), PhD (Oregon St.), Fisheries and Oceans  
 J.S. Craigie, MSc/PhD(Queens), Atl.Reg.Lab,NRC  
 K.H. Mann, PhD(Reading), DSc(Lond.), FRSC, BIO  
 J.L. McLachlan, MA, PhD (Oregon State College), Atl. Reg. Lab, NRC  
 M. Schrempf, PhD (Stuttgart-Hohenheim), Universität Osnabrück, W. Germany  
 M. Silver, PhD (Syracuse)

**Research Associates**

S. Gallagher, PhD (Boston)  
 C.M. Herbinger, MSc (DEA Paris), PhD (Dal), Gene Probe Laboratory  
 J. Hofman, MSc, PhD (U Tenn), Gene Probe Lab  
 G. Pogson, PhD (UBC)  
 E. Retallack, MSc (Dal), PhD (Manchester) Y.  
 Tang, MSc, PhD (Dal)  
 D. Webber, MSc (Dal)  
 J. Zhu-ge, (Wund)

**Honourary Research Associates**

D.Aiken, MSc (New Hamp.), PhD (Alberta), Fisheries and Oceans  
 W.D. Bowen, PhD (UBC), BIO  
 C.D. Caldwell, PhD (East Anglia), N.S. Agric. Coll.  
 S.E. Campana, PhD (UBC), BIO  
 A.T. Charles, PhD (UBC), St. Mary's University  
 D.K. Cone, MSc(Guelph), PhD(UNB), St.Mary's  
 R.J. Conover, PhD (Yale), BIO  
 D.C. Crober, PhD (UBC), N.S. Agric. Coll.  
 S.R.V. Durvasula, MSc,PhD (Andhra)  
 R.W. Elner, PhD (UC North Wales), Fisheries and Oceans  
 K.T. Frank, PhD (Toledo), BIO  
 A.H. Fredeen, PhD (McGill), N.S. Agric. Coll.  
 A.B. Gray, MSc, PhD (McG)  
 B.T. Hargrave, MSc (Dal), PhD (UBC), Fisheries and Environment  
 W.G. Harrison, PhD (North Carolina, Raleigh), BIO  
 H.Y. Ju, PhD (McGill), N.S. Agric. Coll.  
 J.J. Kerekes, MSc (Alberta), PhD (Dal), Canadian Wildlife Environment Canada  
 S.R. Kerr, MSc (Queens), PhD (Cal.), BIO.  
 S.P. Lal, MSc,PhD (Guelph)  
 J.P. LeBlanc, PhD (McG), N.S. Agric. Coll.)  
 J. Nowak, PhD (Olaszyn), PhD (Dal), Fisheries and Oceans  
 A.R. Olson, PhD (Alberta) N.S. Agric. Coll.  
 D.L. Patterson, MSc (Guelph), PhD (Guelph), N.S. Agricultural College  
 T.C. Platt, MA (Tor.), PhD (Dal), BIO  
 R.K. Prange, MSc (UBC), PhD (Guelph)  
 J.D. Pringle, MSc (Victoria), PhD (Dal), Fisheries and Oceans  
 M. Ragan, PhD (Dal)  
 M. Sinclair, MSc, (Southampton), PhD (Scripps Inst.) (Fisheries and Oceans) Appt. through Oceanography  
 T. Tennesen, PhD (Alberta), N.S. Agric. Coll.  
 J.P. van der Meer, PhD(Corn), Atl.Res.Lab, NRC  
 J.L.C. Wright, PhD(Glasgow), Atl.Reg.Lab, NRC

**Honourary Professors**

LA. Meinertzhagen, PhD (St. Andrews), Psychology Dept., Dalhousie  
 R.J. Wassersug, PhD(Chic.), Dept. of Anat, Dal

**Postdoctoral Fellows**

P. Bentzen, MSc (UBC), PhD (McG)  
 A.C. Burke, MA, PhD (Harvard)  
 G. Claireaux, PhD (Brest)  
 R. Escibano, PhD (Dal)  
 A. Graveson, BSc (Bishop's), PhD (Ottawa)  
 R. McGarvey, MA (Oregon)  
 T. Miyake, MS (Michigan), PhD (Texas A & M)  
 J. Nelson, PhD (Michigan)  
 B. Ramsey, MSc (Guelph), PhD (Carl) Gene Probe Lab  
 S. Smith, MSc, PhD (Ottawa)  
 C. Staicer, MSc (NAU)  
 E. Taylor, MSc, PhD (UBC)

The Department encourages applications from prospective postdoctoral fellows. Financial support is available on a competitive basis from a variety of sources (e.g. individual professors, Killam, NSERC). Inquiries should be made before November and can be addressed to the Chair of Biology.

## Admission

The Biology Department has facilities for advanced study and research leading to the MSc and PhD degrees.

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies and normally a student will not be permitted to earn all three degrees (BSc, MSc, and PhD) at Dalhousie. All inquiries for admission to the graduate programme should be addressed to Dr. Finn Sander, Biology Dept.

For minimum times required to complete programmes, see section 6.

## Diploma in Aquaculture

The graduate programme normally requires one year to complete if pursued full time, but may be completed in a longer time on a part-time basis. The minimum entrance requirement is a 3-year BSc degree or its equivalent from a recognized institution of higher education.

Classes and directed individual study programmes will be chosen for each student to provide an understanding of the experimental methods needed to solve problems that arise in the development of aquaculture systems.

The programme for the Diploma in Aquaculture will normally start in September and be completed within 11 months (8 months of class work and 3 months of independent study). During the academic year students will be expected to take a total of 8 half classes.

During the final three months of the course individual directed study will be carried out for an additional credit. The directed study will be supervised by a faculty member and will usually entail the preparation of an extensive paper based on library research but may also be a report of a study or research project undertaken in industry or in the laboratory. Interaction with the local aquaculture industry, research laboratories and government agencies will be encouraged in this final stage.

## MSc Degree Programme

Students are required to obtain five graduate credits; of these at least two must be graduate classes and include Biology 5700C and Biology 5705C; they may include graduate classes from other departments, and in the case of students supervised at Nova Scotia Agricultural College, may include classes given at the College (see Stream E, below). The thesis may count as 1, 2, or 3 credits. Additional classes may be specified

by supervisory committees.

Students are required to demonstrate in an undergraduate biology class for at least one year and must be admitted to candidacy before they are permitted to submit and defend a thesis.

A thesis reporting original research must be submitted and defended orally.

Students are expected to participate in weekly departmental seminars.

## PhD Degree Programme

BIOL 5700C (or 5701C) & BIOL 5705C (or 5706C/5707C) are required classes and additional classes may be specified by supervisory committees.

A preliminary examination on subjects in the general area of the thesis research is required for all PhD students. Students must pass the preliminary examination at least one year before submitting a PhD thesis.

Students are required to demonstrate in an undergraduate biology class for one year, and must be admitted to candidacy before submitting a thesis.

A thesis reporting original research must be defended orally. Students are expected to participate in weekly departmental seminars.

## Streams

Incoming students are assigned to one of five streams; however, they may take classes outside their stream areas. Consult department for details. The streams are:

- A: Ecology/Evolution/Marine Biol/Aquaculture
- B: Plant-Terrestrial Biology/Plant Physiology
- C: Cell/Molecular/Genetics/Microbiology
- D: Development/Animal Physiology
- E: Agricultural Biology

Graduate credit in MSc and PhD programmes will be granted for the following NSAC classes: AS475 Ruminant Digestive Physiology and Metabolism (A.H. Freeden, A. Lirette); B475 Agricultural Biology (J. Nowak); PS475 Plant Biotechnology (J. Nowak).

Graduate credit may be obtained for other NSAC classes on request to the Graduate Coordinator. Some modules in the Dalhousie classes 5705C, 5706C and 5707C will normally be given at Nova Scotia Agricultural College.

## 54 Biology

### Classes Offered

Unless noted otherwise those classes designated A, B, C, are half-credit, all other are one-credit classes.

Classes marked with an asterisk (\*) are offered in alternate years. Please check the current timetable to see whether a particular class is being offered.

**BIOL 5012A Advanced Laboratory in Biochemical Techniques:** Lab. 72 hours total approx. C.J.A. Wallace, J.M. Wright

**BIOL 5020A Advanced Cell Biology:** lecture 3 hours, T.H. McRae

**BIOL 5024A Microscopy:** lecture 2 hours, lab 3 hours, J.H.M. Willison, D.B. Stolz, K.B. Easterbrook, G. Faulkner

**BIOL5030A Topics in Genetics:** sem 2 hrs, R. Lee

**BIOL 5060B Environmental Ecology:** lecture 2 hours, lab/tutorial, 3 hours, B. Freedman

**BIOL 5067B Introductory Fisheries Population Biology:** seminar 2 hours, R.W. Doyle

**BIOL 5068B Limnology:** lec 3 hrs, J.G. Ogden

**BIOL 5070C Advanced Topics in Animal Physiology:** lecture 2 hours, open lab 3 hours, R.K.O'Dor, R. Boutilier, A. Pinder

**BIOL 5072R Animal Nutrition\*:** lecture, seminar 2 hours, J. Castell

**BIOL 5100A Marine Microbiology\*:** lecture 2 hours, seminar, discussions, 2 hours, J.A. Novitsky

**BIOL 5101B Industrial Microbiology and Biochemistry:** lecture, seminar 2 hours, M. Silver

**BIOL 5102A Developments in Biotechnology:** lecture, seminar 2 hours, L. Vining

**BIOL 5214B Physiology and Biochemistry of Marine Algae\*:** lecture 2 hours, J.S. Craigie

**BIOL 5379A Ichthyology:** lec 3 hrs, E.T. Garaide

**BIOL 5439B Topics in Human and Medical Genetics\*:** lecture, seminar 2 hours, O.P. Kamra (Coordinator), J.P. Welch, and E. Zouros

**BIOL 5600B Invertebrate Fisheries and Aquaculture\*:** lecture, seminars, 3 hours, J. Grant, R. Mohn, G.F. Newkirk

**BIOL 5611B Biogeography\*:** lecture 2 hours, seminar 1 hour, J.G. Ogden

**BIOL 5616B Ecosystem Analysis\*:** lecture/discussion 3 hours, P. Lane

**BIOL 5651B Marine Mammalogy:** lec/discussion 3 hours, I. McLaren, H. Whitehead

**BIOL 5652C Ecology Evolution Seminar:** seminar and discussion 1 hour, staff

**BIOL 5654A Plant Ecology:** lec 2 hrs, lab 3 hrs, 1 or 2 field trips on weekends, B. Freedman

**BIOL 5700C Communications Skills for Scientists:** 1 hour, R.P. McBride

**BIOL 5701C Communication Assignment:** 1 hour, R.P. McBride

**BIOL 5705C Graduate Module Class I:** 2 hrs, staff

**BIOL 5706C Graduate Module Class II:** 2 hrs, staff

**BIOL 5707C Graduate Module Class III:** 2 hours, staff

**BIOL 5800-5899 Special Topics in Biology:** staff

**BIOL 5801 A/B/C/R Special Topic in Agricultural Biology**

**BIOL 5802 A/B/C/R Special Topic in Animal Behaviour**

**BIOL 5803 A/B/C/R Special Topic in Animal Physiology**

**BIOL 5804 A/B/C/R Special Topic in Animal Science**

**BIOL 5805 A/B/C/R Special Topic in Aquaculture**

**BIOL 5806 A/B/C/R Special Topic Biochemistry**

**BIOL 5807 A/B/C/R Special Topic in Biological Education**

**BIOL 5808A/B/C/R Special Topic Biomathematics**

**BIOL 5809 A/B/C/R/ Special Topic in Biostatistics**

**BIOL 5810 A/B/C/R Special Topic in Cell Biology**

**BIOL 5811 A/B/C/R Special Topic in Developmental Biology**

**BIOL 5812 A/B/C/R Special Topic in Ecology**

**BIOL 5813 A/B/C/R Special Topic in Environmental Biology**

**BIOL 5814 A/B/C/R Special Topic in Evolutionary Biology**

BIOL 5815 A/B/C/R Special Topic in Fish Biology

BIOL 5816 A/B/C/R Special Topic in Functional Morphology

BIOL 5817 A/B/C/R Special Topic in Genetics

BIOL 5818 A/B/C/R Special Topic in History of Biology

BIOL 5819 A/B/C/R Special Topic in Industrial Microbiology

BIOL 5820 A/B/C/R Special Topic in Limnology

BIOL 5821 A/B/C/R Special Topic in Marine Biology

BIOL 5822 A/B/C/R Special Topic in Marine Ecology

BIOL 5823 A/B/C/R Special Topic in Marine Microbiology

BIOL 5824 A/B/C/R Special Topic in Microbiology

BIOL 5825 A/B/C/R Special Topic in Molecular Biology

BIOL 5826 A/B/C/R Special Topic in Philosophy of Biology

BIOL 5827 A/B/C/R Special Topic in Phycology

BIOL 5828 A/B/C/R Special Topic in Plant Biology

BIOL 5829 A/B/C/R Special Topic in Plant Ecology

BIOL 5830 A/B/C/R Special Topic in Plant Physiology

BIOL 5831A/B/C/R Special Topic in Plant Science

BIOL 5832 A/B/C/R Special Topic in Population Biology

BIOL 5833 A/B/C/R Special Topic in Zoology

BIOL 9000 MSc Thesis

BIOL 9530 PhD Thesis

**Areas of Specialization**

**Stream A - Ecology/Evolution/Marine Biology/Aquaculture**

Biology and culture of lobster and scallops (D.E. Aiken)

Population dynamics and management of seals (W.D. Bowen)

Incremental growth of fish otoliths (S.E. Campana)

Population and community ecology of seaweeds (A.R.O. Chapman).

Ecological, economic and social interactions in fisheries (A.T. Charles).

Ecology; Zooplankton physiology and population studies (R.J. Conover).

Ecological genetics of marine organisms (R.W. Doyle).

Phytoplankton ecology and primary production (S.R.V. Durvasula)

Ecology and population dynamics of lobsters and crabs (R.W. Eimer).

Parasitology; history of biology (J. Farley).

Ethology; development and adaptation in behaviour (J.C. Fentress).

Feeding ecology of zooplankton and ecology of fish larvae (K.T. Frank).

Marine benthic ecology (B.T. Hargrave).

Marine phytoplankton (W.G. Harrison).

Chemical and biological effects of lake acidification; primary production and nutrient-trophic relationships in lakes (J.J. Kerekes).

Marine population studies; ecology (S.R. Kerr).

Seal biology (W.C. Kimmins).

Community ecology, structure and stability of plankton communities, competition-predation phenomena, eutrophication (P.A. Lane).

Analysis of ecosystems. Comparison of system function in coastal inlets and in lakes. Ecological energetics. (K.H. Mann).

Marine botany (J.L. McLachlan).

Population, evolutionary ecology of zooplankton, birds and seals (I.A. McLaren).

Biological oceanography, benthic invertebrates (E.L. Mills).

Aquaculture genetics and bivalve culture (G.F. Newkirk).

Environmental distribution of Sr90; radiocarbon dating; pollen stratigraphy (J.G. Ogden III).

Dynamics and spatial properties of phytoplankton. (T.C. Platt).

Ecology of crustacea and marine plants. (J.D. Pringle)

Foraging and life history strategies of marine invertebrates; population and community ecology of marine benthos (R.E. Scheibling).

Fisheries biology (M. Sinclair).

Genetics of marine algae (J.P. van de Meer).

Predator-prey relationships (S. Walde).

Evolutionary biology; anatomical adaptation (R.J. Wassersug).

Social organization and population biology of whales (H. Whitehead).

Population and ecological genetics; the genetic basis of adaptation and evolution (E. Zouros).

**Stream B - Plant - Terrestrial Biology/Plant Physiology**  
Applied physiology; agricultural engineering; photosynthesis; photorespiration (R.G.S. Bidwell).



Physiology and biochemistry of marine algae (J.S. Craigie).

Forest ecology, pollution and resource management, ecology (B. Freedman).

Experimental analysis of development of seed plants and ferns (G.S. Hicks)

Regeneration and reproduction in lower plants. (K.E. von Maltzahn).

Plant anatomy, taxonomy (A.R. Olson).

Electron microscopy; plant cell wall structure and development (J.H.M. Willison).

**Stream C - Cell/Molecular/Genetics/Microbiology**  
Structure and function of plant cell wall

glycoproteins. Control of expression in yeast and other fungi - role of glucose analogues (R.G. Brown).

Radiation genetics and chemical mutagenesis; cytogenetic effects of food additives and insecticides (O.P. Kamra).

Genetics, characterization and regulation of chloroplast DNA in *Chlamydomonas* (R.W. Lee).

Synthesis and assembly of tubulin; microtubule organization; metals in marine environments (T.H. MacRae).

Marine Microbiology, microbial response to low nutrient conditions (J.A. Novitaky).

Isolating, cloning and identifying genes expressed in killer cells (B. Pohajdak).

Molecular biology of marine plants (M. Ragan).

Molecular genetics (H. Schrepf).

Bacterial leaching and environmental microbiology (M. Silver)

Viruses and parasitism in insects (D.B. Stoltz).

Microbial biochemistry; biotechnology; biosynthesis of antibiotics; metabolic controls (L.C. Vining).

Chemistry of marine natural products (J.L.C. Wright).

The molecular biology of the nuclear matrix (J.M. Wright).

**Stream D - Development Animal Physiology**

Respiratory and acid-base physiology in lower invertebrates (R.G. Bouillier)

Nutrient requirements of aquatic species (J. Castell).

Fish parasites and diseases (D.K. Cone).

Parasitology; history of biology (J. Farley).

Fish nutritional research (S.P. Lall)

Invertebrate nervous systems: Their structural organization and development (I.A. Meinertzhagen).

Reproductive physiology and bioenergetics of mollusca, especially cephalopoda. The life cycle of the squid (R.K. O'Dor).

Development, nutrition, pathology of marine invertebrates (R. Schelbling).

Optics of arthropod compound eyes (S.R. Shaw).

Functional morphology of amphibian larvae (R. Wassersug).

Ultrastructure of trypanosomes and *Trichomonas* (E. Angelopoulos).

Developmental biology, cell differentiation, organ regulation (B.K. Hall).

Comparative animal physiology (A. Pinder).

**Stream E - Agricultural Biology**

Investigation of tacer movement in plant translocation systems (C.D. Caldwell).

Effects of physiological parameters and hormone levels on egg production and fertility in the domestic fowl (D.C. Crober).

Relationship of feeding and management to milk yield (A.H. Fredeen).

Plant pathology in Nova Scotia (A.B. Gray)

Effect of boron nutrition on glucosinolate content in crucifers (H.-Y. Ju).

Pest management and pollination ecology (J.-P.R. LeBlanc).

Plant tissue culture (J. Nowak).

Plant anatomy, taxonomy (A.R. Olson).

Physiology, microbiology and ecology of

nitrogen-fixing plant-bacterial associations;

Biological Agriculture (D.G. Patriquin).

Quantitative genetics of broiler chickens (D.L. Patterson).

Ethology in Canadian Animal Science and its applications to research on cattle (T. Tennesen).

Electron microscopy; plant cell wall structure and development (J.H.M. Willison).

## Business Administration

Location: 6152 Coburg Road  
Halifax, N.S. B3H 1Z5

Telephone: (902) 494-7080

The School of Business Administration offers a curriculum of undergraduate and graduate studies designed to equip students to serve the community in business, government, and the professions.

Graduates in good standing in any discipline can apply to enter the graduate programme leading to the degree of Master of Business Administration. Details of the undergraduate programme leading to the Bachelor of Commerce degree may be found in the calendar for the Faculty of Management.

**Director of the School**

Leonard C. MacLean

**Director, International Business Centre**

Philip J. Rosson

**Coordinator, Student/Public Relations**

M. Eileen MacDougall

**Professors Emeritus**

C.R. Brookbank, BA, MA, PhD (Toronto)

R.E. George, BSc (London), MS (Bristol), PhD (London)

**Professors**

M.A.H. Dempster, BA (Toronto), MS, PhD (Carnegie), MA (Oxford) (Roy A. Jodrey Chair)  
 On leave 1990-93  
 C.R. Dipchand, BComm (Queen's), MBA (Sask.), PhD (Western).  
 L.C. MacLean, BA, Bed (St.FX), MA, PhD (Dal)  
 M.J.C. Martin, BSc (Nottingham), PhD (Sheffield)  
 J.D. McNiven, BA, MA, PhD (Mich.)  
 J.R.E. Parker, B Comm (Dal), MBA (Wash.), CPhil (Mich.), CA  
 G.S. Roberts, AB(Oberlin), MA/PhD(Boston Col)  
 P.J. Rosson, Dip. MS (Salford), MA (Lancaster), PhD (Bath.)  
 Y. Sankar, BA(McG), MA (Tor), PhD (Johns Hopkins)  
 D.A. Schellinck, BSc, MBA (Dal), PhD (Ill.)

**Associate Professors**

B.C. Archibald, BA (Queen's), MSc (Stanf.), PhD (Wat.)  
 R.G. Blunden, BComm (Dal), MM (Northwestern)  
 M.R. Brooks, BOT (McG.), MBA (Dal), PhD (Wales)  
 R. Carroll, BBA, BEd (St. FX), MBA (Dal), CGA  
 D.C. Cherry, B Comm (Dal), MBA (McM), CMA  
 J.E.D. Conrod, BComm (Dal), MBA (Tor), CA  
 F.G. Crane, BA (Acadia), DPA, MPA (Dal.), P. Adm. (P.A.D.I.C.S.A.), PhD (Bradford)  
 C.J. Dirksen, BS (Santa Clara), MBA, PhD (Oregon)  
 J.F. Duffy, BS, MS, PhD (Iowa)  
 R.A. Ellison, BSc (UNB), MBA (McM.), PhD (Tenn.)  
 I. Fooladi, BSc (Iran), MA (Tehran), MS, PhD (Ore.)  
 R.E. Klapstein, BSc (Calg.), BA (Alta.), MBA, LLB (Dal), LLM (Osgoode Hall), CMA  
 S.O. Larson, BSc (SGW), MSc (Alta.), PhD  
 R.N. Maddox, BA, MBA, PhD (Ohio)  
 L.W. Mealiea, AB, MBA (Rutgers), PhD (Mass.)  
 A. Oppong, BSc (Ghana), MBA (Chic.), PhD (Iowa), CGA  
 D.J. Patton, BA (UNB), MA (Tor.), DBA (Indiana)  
 A.C. Peacock, BA, MA, PhD (UWO)  
 R.S. Sandhu, BSc, BCL, LLM (Delhi), LLM (Yale), MBA (Dal)  
 E.W. Scott, BComm (Dal), MBA (Col.), CA, CMA  
 Y. Shafai-Sahrai, BSc, MPA (Tehran), MBA, PhD (Mich.)  
 D.P.J. Sheridan, CD, BA, BEd, MEd (Admin.)(Sask.), PhD (Alta.)  
 R.A. Street, BComm, LLB, LLM (Dal), MBA (Western)

**Assistant Professors**

R.G. Baltazar, BSc(Ateneo de Manila), MIM,AGSIM

H.I. Gassmann, Vordiplom (Stuttgart), MS (Oregon), PhD (UBC)  
 J.K. Grude, BA (Alta), MSc, PhD (London)  
 L.P. Hendry, BSc (SMU), MBA (Dal)  
 B.W. MacLean, BComm, MBA (Dal), CA  
 F.S. Skinner, BComm (MUN), MBA (Tor)

**Visiting Professor**

D.I. Riddle, BA (Colorado), MBA (Arizona), PhD (Duke)

**MBA Programme**

Additional information on the MBA programme, including course descriptions, is found in a brochure published by the School of Business, and available from Graduate Admissions or the School. Students seeking further information should contact:

M. Eileen MacDougall  
 Coordinator, Student and Public Relations  
 School of Business Administration  
 6152 Coburg Road  
 Halifax, N.S. B3H 1Z5  
 Telephone: (902) 494-7080

The aim of the MBA programme is to prepare students to become effective managers in small or large organizations. The programme concentrates on developing the ability to make sound decisions and judgements, and trains students in the analysis and evaluation of data for decision making. These skills have wide application in business, government and other organizations. Core courses develop basic skills, while elective subjects strengthen functional skills and deepen understanding of the complex and changing environment facing modern organizations. Required modules in communication and career management develop skills through application. Integration of current computer technology into the curriculum ensures that the learning environment closely approximates that in which graduates will be working. While students may choose to concentrate elective studies in one or two areas, there is no requirement that a major be formally declared.

**Admission Requirements**

Regulations of the Faculty of Graduate Studies govern admissions. Admission is approved by the Dean of the Faculty of Graduate Studies, on the recommendation of the School of Business Administration. Applicants must hold a degree recognized by Dalhousie University as the equivalent of a Bachelor's Degree in one of its own faculties. Applicants are welcomed from those who have concentrated in the humanities, the social sciences, the physical sciences and engineering.

The School of Business actively seeks applicants with relevant full-time work experience, but some candidates will be admitted directly from

undergraduate studies. A resume should accompany every application.

All applicants are required to submit results of a Graduate Management Admission Test (GMAT). Information on test dates, locations and registration can be obtained from the Dalhousie Registrar, or by writing directly to GMAT, Educational Testing Service, Box 966, Princeton, NJ, U.S.A. 08541.

Candidates whose native language is not English are required to submit results of the Test of English as a Foreign Language (TOEFL). Information on test dates, locations and registration can be obtained by writing to TOEFL, Educational Testing Service, P.O. Box 899, Princeton, NJ, U.S.A. 08540.

Admission criteria and procedures are identical for the part-time and full-time programmes.

Admissions are made on a rolling basis, commencing in February for the following September. Admission is made only for the academic year beginning in September. Interim (official) transcripts will be considered for candidates currently attending university, if all other documentation is complete. Since space in the programme is limited, it is strongly recommended that all documents be submitted before May 31. (March 31 for foreign students). Applications received after these dates will be considered on a space available basis.

Applications received after July 15 cannot be processed. A complete application includes:

- Faculty of Graduate Studies application form
- GMAT results
- TOEFL results, where applicable
- 2 transcripts from each institution attended
- 2 copies of a brief statement explaining how You expect the Dalhousie MBA to benefit you, and what you will contribute to the programme.
- 2 copies of your resume

The application form should be sent to the Office of the Registrar together with the application fee. Other documentation should be sent directly to MBA Admissions, School of Business Administration. Reference letters must be originals, sent directly to the School by the referees. Only official transcripts received directly from the issuing institution will be accepted. GMAT and TOEFL score reports must be forwarded by the Educational Testing Service.

All admitted applicants must confirm in writing their acceptance of the offer of a place, and provide a deposit of \$100. This fee will be applied toward tuition but will be forfeited if the student does not register in the academic year for which he or she was admitted. Please note that this deposit is separate from any application or pre-registration fees, and is the means by which candidates to who orientation materials are to be sent are identified.

Tuition deposits are normally due:

- by April 30 for offers made before April 1
- within 30 days for offers made between April 1 and June 15
- within 10-15 days for offers made after June 15

The Faculty of Law may require a deposit in addition to that required by the School of Business.

## Grading System and Good Standing

Under the regulations of the Faculty of Graduate Studies and the requirements of the School of Business, MBA students are required to achieve a grade of B- or better in all classes taken. Full-time students are permitted to continue in the programme with one C grade if an overall B average is maintained for the year. This special exception is available only to full-time students. No credit towards a degree is granted for any class in which a grade of less than B- is obtained.

Students who do not meet these requirements may not continue in the programme unless readmission is recommended by the School and approved by the Faculty of Graduate Studies.

Failed Core I classes must be repeated and passed at the earliest opportunity; failed elective or core II classes may be repeated and passed or replaced. A second failure in the same course, regardless of when such failure occurs, will normally result in immediate dismissal from the MBA programme. In order to graduate, students must achieve an overall B average for the programme.

Within two weeks of the first meeting of a class, each instructor shall make available a written description of the method of evaluation to be used in this class. In any course for which 25 percent or more of the evaluation is based on group work, there must be an exam(s), which must be passed on average.

Special examinations may be granted to students only in the case of illness supported by a medical certificate, or in other exceptional circumstances. Medical certificates must be submitted at the time of the illness and will not normally be accepted after a lapse of one week from the date of the examination.

## Part-time MBA Programme

The MBA degree may be earned through part-time study. A student must complete the requirements for the MBA degree within six years of initial enrolment in the programme. Extensions may be granted in special cases upon petition to the Faculty of Graduate Studies.

Most core classes and a selection of electives are offered at night each year, and any summer classes offered are scheduled at night.

There is no prescribed order of completion of courses in the part-time programme, except as dictated by course prerequisites. However, MBA 6001C (Business Policy) is one of the last classes taken, since it provides an integration of the whole programme and requires a major field project.

No more than five (5) half-credit classes may be taken in each twelve month year, including summer sessions. Only Graduate level classes approved for Summer Session offering will be eligible for credit.

Part-time MBA students will be enrolled in classes together with full-time MBA students.

### **Advanced Standing**

Students with relevant academic background may receive some advanced standing for core classes in the MBA programme. For further information, contact the MBA coordinator. Full-time students will not normally be permitted to carry less than a full work load in the first year of the programme, regardless of the number of waivers granted. Students requiring more than thirteen half courses for the degree will be registered in a two year programme and must pay two years' tuition (or equivalent in part-time fees).

### **International Business**

There are no formal concentration requirements in the MBA programme but students hoping to be considered for International Business Fellowships are expected to complete: 6801 The Firm in the International Environment, 6802 Strategic Management of International Operations, and at least two of the other International Business courses offered by the School. These include:

- 6803 International Transportation
- 6804 Ocean Shipping Seminar
- 6805 Seminar on Marine Resources and Ocean Industry
- 6806 International Marketing
- 6807 International Financial Management
- 6808 International Banking
- 6809 International Trade in Services
- 6812 Foreign Study Mission
- 6813 Management and the Natural Environment
- 6315 Intercultural and Comparative Management

In addition, MBA 6553 Managing Technological Innovation is designed with significant international content.

### **Combined LLB and MBA Programme**

This is a four-year programme which enables students to select classes leading to the degrees of Bachelor of Laws and Master of Business Administration. The usual order of the programme is:

**Year 1:** First-year classes of MBA programme, with a minimum of twelve half-credit classes. See "Programme Structure" for details.

**Year 2:** First-year classes of the LLB programme.

**Year 3:** Three half-credit classes from the MBA programme plus 25 hours of classes from the LLB programme, including 7/9 hours from the Business Law area.

**Year 4:** Two half-credit classes, including MBA 6001, from the MBA programme, and between 23 and 25 hours of classes in law.

Years 1 and 2 may be reversed, but students wishing to do so should advise both Schools as early as possible.

Candidates for the MBA/LLB programme must also satisfy the entrance requirements of the Faculty of Law (see calendar of that Faculty) and may obtain further information about the combined programme by writing either to the Faculty of Law or to the Co-ordinator of the MBA programme. For admission, students must apply to both the Law School and the Business School.

### **Programme Structure**

All MBA classes are half-credit classes. The MBA programme includes nine Core I classes, five Core II classes, two required non-credit classes (except MBA/LLB), and seven free electives, (four for MBA/LLB).

Full-time students are normally required to carry a full course load in the first year, consisting of ten half-credit classes and two non-credit classes. These will normally include eight Core I classes and two classes which may be either from Core II or free electives.

#### **First Term**

- MBA 5001A: Communications and Career Management Skills I (non-credit)
- MBA 5101A: Financial Accounting
- MBA 5311A: Organizational Behaviour
- MBA 5501A: Business Statistics
- MBA 5502A: Operations Research
- MBA 5701A: Economic Decision-Making: The Firm

#### **Second Term**

- MBA 5002B: Communications and Career Management Skills II (non-credit)
  - MBA 5201B: Finance
  - MBA 5401B: Marketing Management
  - MBA 5551B: Operations Management
- Plus 2 electives or Core II classes (see below).

Combined MBA/LLB students take six half-credit courses in each term of the first year, and are not required to take MBA 5001A and 5002B.

#### **Core II**

Core II requirements may be met in the first or second year. Some electives may have Core II prerequisites. Students with no academic business

background are encouraged to take all Core II classes; all students are required to take:

**A. Three of:**

MBA 5702 Economic Decision-Making: The Economy

MBA 5102 Managerial Accounting

MBA 5312 Organizational Design

MBA 6903 Management Information Systems; and

**B. Two of:**

MBA 6801 The Firm in the International Environment

MBA 6901 Business Law

MBA 6902 Business and Government

MBA 6002 A Or B: New Venture Creation

MBA 6003 A or B: Managing Diversification

Note: 6002 and 6003 may not both be used to fulfil Core II requirements. If both are taken, one will be counted as an elective.

(MBA/LLB candidates-1 of: 6801,6902,6002,6003.)

The second year normally includes MBA 6001 (Core I), electives, and Core II classes to total eleven classes. The variety of electives allows a student to develop a programme in keeping with his/her career plan. Not all classes will necessarily be offered every year. In addition, new classes may be added from time to time. Therefore, students should check with the School for up-to-date information.

Students may also elect to take, with the approval of the School, a limited number of graduate classes in other faculties and departments, such as Mathematics, Statistics and Computing Science (e.g. CS5201), Resource and Environmental Studies, Economics, Public Administration, Law, etc. Throughout the programme, candidates will be expected to attend lectures given by visiting professors and business executives and to take part in projects involving the analysis of the problems of local business firms.

**Core Class: Required for all students**

MBA 6001C Business Policy: seminar,

Prerequisite: all first-year MBA classes

**Elective Classes**

Note: It may not be possible to offer every elective class each year. Please consult the university timetable for a list of current offerings.

**Accounting**

MBA 6101A/B Public Auditing: seminar,

Prerequisite: MBA 5101

MBA 6102A/B Taxation: seminar, Co-requisite:

MBA 5101, MBA 5701

MBA 6103A/B Advanced Taxation: seminar,

Prerequisite: 6102

MBA 6106A Advanced Managerial Accounting 1:

Cost Accounting: lecture, Prerequisite: MBA 5102 or permission of the instructor

MBA 6107B Advanced Managerial Accounting 2: Organizational Control: lecture, Prerequisite: MBA 6106 or permission of the instructor

MBA 6108A/B Advanced Financial Accounting 1: lecture, Prerequisite: MBA 5101 or instructor's consent

MBA 6109A/B Advanced Financial Accounting 2: lecture, Prerequisite: MBA 6108 or permission of the instructor

MBA 6112A/B Financial Statement Analysis: lecture, Prerequisite: MBA 5101, MBA 5201, and MBA 5501

**Finance**

MBA 6201A/B Investments: lecture, Prerequisite: MBA 5201. Recommended: MBA 5102

MBA 6202A/B Investments II: lecture, Prerequisite: MBA5201. MBA6201 or MBA6205 recommended

MBA 6203A/B Canadian Capital Markets: lecture, Prerequisite: MBA 5201. Recommended: MBA5102

MBA 6204A/B Short-Term Financial Management: lecture, Prerequisite: MBA 5201, Recommended: MBA 5102

MBA 6205A/B Capital Budgeting: lecture, Prerequisite: MBA 5101 and MBA 5201

MBA 6206A/B Portfolio Theory: lecture, Prerequisite: MBA 5101 and MBA 5201

MBA 6807A/B: (see International Business)

**Management**

MBA 5321A/B Introduction to Human Resource Management: lecture, Prerequisite: MBA 5311 or permission of the instructor

MBA 5331A/B Introduction to Labour Management Relations: seminar, Prerequisite: MBA 5311 or permission of the instructor

MBA 6313A/B Organizational Change: seminar & lecture, Prerequisite: MBA 5311 & MBA 5312 or permission of the instructor

MBA 6315A/B Intercultural and Comparative Management: lecture, Prerequisite: MBA 5311, MBA 5312 (may be taken concurrently), MBA 6801 strongly recommended

MBA 6322A/B Selection: Testing & Interviewing: sem/lec, Prerequisite: MBA 5321 or instructor's consent

MBA 6323A/B Training & Development: seminar, Prerequisite: MBA 5321

**MBA 6324A/B Performance Appraisal & Compensation:** seminar/lecture, Prerequisite: MBA 5321 or permission of the instructor

**MBA 6326A/B Management Development:** seminar, Prerequisite: MBA 5311 or instructor's consent

**MBA 6332A/B Collective Bargaining:** seminar, Prerequisite: MBA 5331 or permission of the instructor

**MBA 6333AB Comparative Labour Relations:** seminar, Prerequisite: MBA 5331 or permission of the instructor

**Marketing and Transportation**  
**MBA 5402A/B Buyer Behaviour:** lecture, Prerequisite: MBA 5401

**MBA 6401A/B Marketing Research and Information Systems:** scm, Prerequisite: MBA 5402, MBA 5401; strongly recommended MBA 6504

**MBA 6402A/B Marketing Channels:** lecture, Prerequisite: MBA 5401; recomb: MBA 5402

**MBA 6403A/B Advertising Management:** lec/scm Prerequisite: MBA 5401; recom: MBA 5402

**MBA 6404A/B Consumer Behaviour:** seminar, Prerequisite: MBA 5401 and MBA 5402

**MBA 6405A/B Sales Management:** lecture & case studies, Prerequisite: MBA 5401

**MBA 6406A/B Domestic Transportation:** lec/scm

**MBA 6407A/B Physical Distribution Management:** lec/scm, Prereq: MBA5551 or instructor's consent

**MBA 6408A/B Transportation Management:** lecture, Prerequisite: MBA 5201 and MBA 5311

**MBA 6450B Marketing Strategy Seminar:** seminar, Prerequisite: MBA 5401, and at least two 6000-level marketing classes, (which may be taken concurrently) or instructor's consent

**MBA 6803A/B:** (see International Business)

**MBA 6804A/B:** (see International Business)

**MBA 6806A/B:** (see International Business)

**Management and Information Science**  
**MBA 6501A/B Operations Research II:** lecture, Prerequisite: MBA 5501 and 5502

**MBA 6502A/B Forecasting Models:** seminar, Prerequisite: MBA 5501 or equivalent

**MBA 6503A/B Simulation Models:** lecture & seminar, Prerequisite: MBA 5501 and 5502

**MBA 6504A Applied Statistics:** seminar, Prerequisite: MBA 5501

**MBA 6505A/B Managerial Decision Making:** lecture/seminar

**MBA 6507R Advanced Operations Research Project:** tutorial, Choice of instructor, See the M. & I.S. area co-ordinator for requirements

**MBA 6904A/B Systems Analysis and Design:** seminar, Prerequisite: MBA 6903

**MBA 6905A/B Special Topics in Management Information Systems:** seminar, Prereq: MBA 6903

**MBA 6906A/B Database Management Systems:** lecture/seminar, Prerequisite: MBA 6903

**MBA 6907A/B Management of the Information Resource:** seminar, Prerequisite: MBA 6903

### **International Business**

**MBA 6802A/B Strategic Management of International Operations:** seminar, Prerequisite: MBA 6801

**MBA 6803A/B International Transportation:** seminar, Prerequisite: MBA 6801 (recommended)

**MBA 6804A/B Ocean Shipping Seminar:** seminar, Prerequisite: MBA 6803

**MBA 6805A/B Seminar on Marine Resources and Ocean Industry:** seminar

**MBA 6806A/B International Marketing:** seminar, Prerequisite: MBA 5401, MBA 6801 is strongly recommended

**MBA 6807A/B International Financial Management:** seminar, Prerequisite: MBA 5701, 5702, 5201 and 5101, MBA 6801 is strongly recommended

**MBA 6808A/B International Banking:** seminar, Prerequisite: MBA 5701, 5702, MBA 6801 is strongly recommended

**MBA 6809A/B International Trade in Services:** Lecture/Seminar

**MBA 6812 Foreign Study Mission**

**MBA 6813 Management and the Natural Environment - An International Perspective**

**MBA 6553A/B Managing Technological Innovation:** seminar

**General**

MBA 6901A/B Business Law: seminar

MBA 6902A/B Business and Government: lecture

MBA 6951A/6952B Research Reading and

Conference: choice of instructor

**Chemistry**

**Location:** Chemistry Building  
Dalhousie University  
Halifax, N.S. B3H 4J3

**Telephone:** (902) 494-3305  
**Fax:** (902) 494-1310

**Chairperson of Department**

J.C.T. Kwak

**Professors Emeritus**

W.J. Chute, BSc (Acadia), MA, PhD (Tor.)

O. Knop, DSc (Laval), Harry Shirreff Professor of  
Chemical ResearchD.E. Ryan, BSc (UNB), MA (Tor), PhD, DSc  
(Lond.), DIC**Professors**

D.R. Arnold, BS (Bethany College), PhD (Roch.)

W.A. Aue, PhD (Vienna)

R.J. Boyd, BSc (UBC), PhD (McG)

T.S. Cameron, BA, MA, DPhil (Oxon.)

A. Chatt, BSc (Calcutta), MSc (Roorkee), MSc  
(Wat.), PhD (Tor.)

H.C. Clark, BSc, MSc, PhD (Auckland), PhD,

ScD (Cambridge), President, Dalhousie University

J.A. Coxon, MA(Cantab), MSc, PhD(East Anglia)

T.P. Forrest, BSc (MtA), MSc (Dal), PhD (UNB)

J.S. Grossert, BSc, MSc, PhD (Natal)

W.E. Jones, BSc, MSc (MtA), PhD (McG),

J.C.T. Kwak, BSc, MSc, PhD (Amsterdam)

K.T. Leftek, BSc, PhD (Lond.)

P.D. Pacey, BSc (McG), PhD (Toronto)

J.A. Pincock, BSc, MSc (Man), PhD (Tor)

R. Stephens, MA (Cantab.), MSc (Bristol), PhD  
(London), DIC

R.E. Wasylshen, BSc (Wat.), MSc, PhD (Man.)

**Associate Professors**

T.B. Grindley, BSc, MSc, PhD (Queen's)

K.R. Grundy, BSc, MSc, PhD (Auckland)

R.D. Guy, BSc (SFU), PhD (Carleton)

D.L. Hooper, BSc, MSc, PhD (UNB)

L. Ramaley, BA (Col.), MA, PhD (Prin.)

C.H. Warren, BSc (UWO), PhD (McM)

M.A. White, BSc (UWO), PhD (McM)

**Assistant Professors**N. Burford, BSc (Univ. of Wales College, Cardiff),  
PhD (Calgary)

P.G. Kusalik, BSc (Lethbridge), MSc, PhD (UBC)

NSERC University Research Fellow

P.D. Wentzell, BSc (Dal), PhD (Mich. State)

R.L. White, BSc (Dal), PhD (McMaster)

**Adjunct Professors**

A.J. Thakkar, Univ. of New Brunswick

K. Vaughan, Saint Mary's Univ.

**Honorary Research Associate**

M.J. Zaworotko, Saint Mary's

**Visiting Scientists (1990)**T.C. Chang, National Cheng Kung Univ., Tainan,  
Taiwan

J. Kankare, Univ. of Turku, Finland

Alguo Liu, Shandong Inst. of Chemistry, China

C. Sarasola, Euskal Herriko Unibertsitatea, Spain

G. Schmid, Univ. of Toronto

J. Wang, National Cheng Kung Univ., Tainan,  
Taiwan

J.M. Ugalde, Euskal Herriko Unibertsitatea, Spain

Liang Chen Wang, E. China Univ. of Chem.  
Tech., Shanghai, China**Instructors**

C.D. Burkholder, BSc (Wat.)

C.M. Byers, BSc Honors (Dal)

J. Gabor, MSc (Budapest)

S.A. Sawier, BSc, (MSVU)

D.J. Silvert, MSc (CWRU)

W.D. Tacreiter, MSc (Krakow)

K.E. Thompson, BSc (Acad.)

M.E. Warren, BSc (Western)

**Postdoctoral Fellows (1990)**

W. Galczowski, PhD (Mickiewicz Univ., Poznan)

Z. Gao, PhD (Dal)

Z. Shi, BSc (Shangdong), PhD (Dal)

R. Thangarasa, PhD (Dal)

**Research Assistants/Associates**

R. Cordes, BSc (Dal), MSc (UBC)

H. Furue, PhD (Queen's)

P. Hajigeorgiou, BSc, (Dal)

M. Li, (Quinghai Inst. of Salt Lake Chinese  
Academy of Science)

R.R. Rao, PhD (IIT, Bombay)

Programmes leading to MSc and to PhD degrees are offered. Research for these degrees can be undertaken in analytical, inorganic, organic, physical or theoretical chemistry.

**Admission Requirements**

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. In some cases an MSc Degree may be required as a prerequisite for entry into a PhD programme. It is recommended that all students from outside Canada submit the results of the advanced Graduate Record Examination in

Chemistry. In some cases this will be made a precondition to consideration of the student's application for admission. For those whose first language is not English a TOEFL is required.

## General Regulations

All graduate students are required as part of their training, to instruct in the undergraduate laboratories and to attend departmental seminars, Chem 5880, which are given by invited speakers. The Department will hold an annual meeting at which time it will review the work of all graduate students. Permission to continue will be contingent upon a satisfactory decision by the Department.

All graduate students must be in the department and available for demonstrator duties by September 1st of each year.

Further details of degree regulations are presented in a Handbook for Graduate Students in Chemistry, which may be obtained from the Departmental Office.

## MSc Degree

### Full time Programme

Two full credit classes, or the equivalent, together with the presentation and oral defence of a thesis based on original research are required. Faculty regulations permit a 1-year MSc candidate to graduate after 12 months of resident study. Experience has shown that most MSc candidates in the Department require at least 16 months to complete their work. Financial support is not available for more than two years.

### Part time Programme

The full time MSc class requirements and thesis regulation apply. However, students enrolled in the part time MSc programme are expected to complete their class work in four years and their thesis work in six years. The thesis must be supervised by a member of the Department. No stipends are available from the Faculty of Graduate Studies.

## PhD Degree Programme

Three full-credit classes, or the equivalent, are required. A preliminary oral examination must be completed successfully. Original research, together with preparation and oral defence of a thesis, is required.

For the minimum time required to complete the programme, see Section 6. Financial support is not available for more than four years.

## Classes Offered

Two types of graduate classes are offered by the Department - core classes and specialized classes. The core classes constitute the main framework of a student's formal course work, and are designed to be broad-based but at an advanced level. They are intended to help the student gain a wide understanding in several major

branches of chemistry and thus students are required to take such classes outside their area of specialization. The following half-credit core classes are offered at least every other year. Please consult the current timetable.

### Analytical

**CHEM 5201 - Advanced Topics in Separations**

**CHEM 5202 - Topics in Advanced Analytical Spectroscopy**

### Inorganic and Structural

**CHEM 5101 - Topics in Advanced Main Group Chemistry**

**CHEM 5102 - Topics in Advanced Transition Metal Chemistry**

**CHEM 5103 - Topics in Solid State Chemistry**

**CHEM 5104 - General Adv Inorganic Chemistry**

### Organic

**CHEM 5401 - Synthesis in Organic Chemistry**

**CHEM 5402 - Organic Structure Determination**

**CHEM 5403 - Organic Reaction Mechanisms**

### Physical and Theoretical

**CHEM 5301 - Theory of Chemical Bonding**

**CHEM 5304 - Kinetics and Catalysis**

**CHEM 5305 - Introductory Statistical Thermodynamics**

**CHEM 5306 - Magnetic Resonance**

**CHEM 5308 - Molecular Spectroscopy**

### Interdisciplinary

**CHEM 5503 - Symmetry and Group Theory**

**CHEM 5504 - Diffraction Techniques in Solid State Chemistry**

Additional specialized classes at the 6000 level provide the opportunity for in-depth study of selected topics which are more closely related to the student's research area. These classes vary from year to year depending on students' needs and interests. Some of the topics covered recently in specialized classes include: X-ray crystallography, free radical chemistry, pollution evaluation, organic photochemistry, organic electrochemistry, nuclear chemistry, electronics for scientists, carbohydrate chemistry, analytical flame spectroscopy, electrolyte solutions, heteroatomic chemistry, colloid and surface science, chemical kinetics, solid state chemistry, and advanced electron structure theory.



Approved classes from departments other than Chemistry may be taken for credit.

## Chemistry Research Interests

### Analytical Chemistry

W.A. Aue: Basic and applied chromatography.

A. Chatt: Nuclear and bioanalytical methods for trace elements and studies on radioactive waste management

R.D. Guy: Method development for the speciation of toxic metals and organic chemicals.

L. Ramaley: Electroanalytical chemistry, mass spectrometry and chemical instrumentation.

R. Stephens: Analytical atomic spectroscopy.

P.D. Wentzell: Flow injection analysis, kinetics, acoustic emission analysis and chemometrics.

### Inorganic and Structural Chemistry

N. Burford: Synthesis, structure and bonding of compounds of the Main Group Elements.

T.S. Cameron: X-ray structural studies on inorganic, organic and organometallic compounds; hydrogen bonding; molecular modelling and charge densities.

H.C. Clark: Chemistry of organo and hybrid platinum and palladium compounds.

K.R. Grundy: Synthesis and reactivity of low-valent organometallic complexes and their utilization in organic synthesis.

O. Knop: Structural and solid-state inorganic chemistry.

### Organic Chemistry

D.R. Arnold: Photochemistry, especially the development of synthetically useful methods; reactions of radical ions.

T.P. Forrest: Stereochemistry; nmr spectroscopy; expert systems for spectroscopic interpretation.

T.B. Grindley: The chemistry of carbohydrates and of carbanions; conformational analysis.

J.S. Grossert: Synthetic, structural and spectroscopic aspects of organosulphur chemistry; effects of pressure on reactions in solution.

D.L. Hooper: Spectroscopic methods, especially high field multinuclear nmr, applied to chemical problems.

K.T. Leffek: Physical organic chemistry, including the study of reaction mechanisms and structure of strong neutral bases.

J.A. Pincock: Studies on reaction mechanisms involving both ground and excited states.

R.L. White: Biosynthesis of natural products, especially amino acids and antibiotics, and enzymes of secondary metabolism.

### Physical and Theoretical Chemistry

R.J. Boyd: Analysis of electron correlation and electron density distributions; theoretical studies of reaction mechanisms and molecular interactions.

J.A. Coxon: Electronic spectra of small molecules;

laser spectroscopy; weak chemiluminescence; potential energy curves.

W.E. Jones: Atomic and molecular spectroscopy; gas phase kinetics; laser enhanced surface chemistry and catalysis.

P.G. Kusalik: Computer simulation and theoretical studies of polar solvents and electrolyte solutions; liquid state theory.

J.C.T. Kwak: Colloid and polymer chemistry.

P.D. Pacey: Temperature dependence of reaction rates.

C.H. Warren: Laser Raman, laser induced fluorescence, and molecular spectroscopy.

R.E. Wasylshen: Applications of multinuclear nmr, including relaxation techniques, magic angle sample spinning, single crystal nmr and modern 2-D solid state nmr techniques to study: molecular motions in liquids, inclusion compounds and disordered solids, the measurement of dipolar, shielding, and quadrupolar tensors; the conformation and structure of molecules in condensed phases.

M.A. White: Thermal properties of solids, especially heat capacity and thermal conductivity.

## Classics

Location: 1244 LeMarchant Street  
Halifax, N.S. B3H 3P7

Telephone: (902) 494-3468

### Chairperson of Department

R. Friedrich

### Professors Emeritus

J.A. Doull, BA (Dal), MA (Tor.)

A.H. Armstrong, MA (Cantab), FBA

### Adjunct Professor

E. Segelberg, DTh, FK (Uppsala)

### Professors

J.P. Atherton, MA (Oxon.), PhD (Liverpool) -  
Graduate Studies Coordinator

R.D. Crouse, BA (Vind.), STB (Harv.), MTh  
(Trin.), PhD (Harv.)

R. Friedrich, Dr.phil. (Gott.)

### Associate Professors

W.J. Hankey, BA (Vind.), MA (Tor.), Ph.D.  
(Oxon.)

D.K. House, MA (Dal), PhD (Liverpool)

P.F. Kussmaul, PhD (Basle), Ph.D. habil.  
(Heidelberg)

C.J. Sarnes, BA (Bishop's), STB (Harvard), MA  
(McG), PhD (Dal)

The Department invites applications especially from students of wide humanistic interests who wish to study contemporary culture

through its ancient origins.

The graduate teaching and research of the Department is chiefly in the following areas:

- (a) Greek and Latin Poetry.
- (b) Hellenistic and early Christian history.
- (c) Greek Philosophy; Aristotle and the history of Aristotelian philosophy (from the Greek commentators to Hegel).

MA students may concentrate their work in any of these areas. PhD candidates must work in the area of Hellenic and Hellenistic Studies.

## Admission Requirements

Candidates must satisfy the admission requirements of the Faculty of Graduate Studies. The requirement of both Classical languages at Honours level may sometimes be relaxed, e.g., where a student has taken a Combined Honours course involving only one Classical language. In such cases at least two classes in the second language will be taken in addition to the MA course proper. In certain programmes, a knowledge of other ancient languages may be required.

## MA Degree Programme

It will rarely be possible for candidates to complete their classes and thesis in less than a calendar year.

Three graduate seminars, two in the general area of interest and a reading and research class related to the thesis subject are required.

Candidates are expected to attend graduate seminars related to their theses throughout their period of full-time study. A thesis is required.

MA students should obtain a copy of the Departmental regulations for the degree.

## PhD Degree Programme

The normal admission requirement is the Dalhousie MA in Classics, or equivalent preparation. The minimum residence requirement for such candidates is two years, during which time they must satisfy the general requirements of the Faculty, and, in addition, must demonstrate competence in the languages (ancient and modern) necessary for research in their particular fields of study.

All candidates are expected to have a broad understanding of all aspects of Classical culture, and within the general area of Hellenic-Hellenistic Studies, each candidate is expected to concentrate, with the guidance of a Supervising Committee, in one of three fields: History, Literature and Philosophy. Before submitting a thesis, the candidate must pass a comprehensive examination (written and oral) in his/her special field: this will normally be taken towards the end of the second or beginning of the third year of study.

## Classes Offered

### Greek and Latin Literature

CLAS 5010 Seminar on Greek Literature (1): R. Friedrich

CLAS 5020 Seminar on Greek Literature (2): R. Friedrich

CLAS 5030 Seminar on Latin Literature (1): R. Friedrich/J.P. Atherton

CLAS 5040 Seminar on Latin Literature (2): R. Friedrich/J.P. Atherton

### Ancient History

CLAS 5530 Reading and research in Ancient History (1): P.F. Kusmaul

CLAS 5531 Reading and research in Ancient History (2): P.F. Kusmaul

CLAS 5550 Reading and research in Ancient History (2): P.F. Kusmaul

CLAS 5551A Reading and research in Ancient History: P.F. Kusmaul

CLAS 5552B Reading and research in Ancient History: P.F. Kusmaul

### Classical Philosophy

CLAS 5600 Seminar on the Philosophy of Aristotle: J.P. Atherton

CLAS 5601 Seminar on Plato and Neoplatonism: J.P. Atherton

CLAS 5602 Seminar on Hellenistic Philosophy: D.K. House

CLAS 5603 Seminar on the Philosophy of Plato: D.K. House

### Patristics

CLAS 5700 Seminar on the Philosophy of the Church Fathers: R.D. Crouse

CLAS 5701 Seminar on the Medieval Interpreters of Aristotle: R.D. Crouse

CLAS 5705 Seminar on St. Augustine (1): C.J. Starnes

CLAS 5706 Seminar on St. Augustine (2): C.J. Starnes

CLAS 5800 Seminar on Christian Beginnings: W.J. Hankey

**CLAS 5801 Seminar on Christianity and Neoplatonism:** W.J. Hankey

**Classes Occasionally Offered**

**Greek and Latin Literature**

**CLAS 5011 Seminar on Greek Tragedy:** R. Friedrich

**CLAS 5012 Seminar on Greek Comedy:** R. Friedrich

**CLAS 5013 Seminar on Greek Lyric:** R. Friedrich

**CLAS 5031 Seminar on Roman Satire:** Staff

**CLAS 5032 Seminar on Roman Historians:** Staff

**CLAS 5033 Advanced Seminar on Latin Literature:** Staff

**CLAS 5034 Seminar on Greek Literature**

**Ancient History**

**CLAS 5531 Seminar on the Roman Empire and the Rise of Christianity:** P.F. Kussmaul

**CLAS 5551 Ancient Law and Jurisprudence:** P.F. Kussmaul

**Classical Philosophy**

**CLAS 5604 History of the Interpretation of Aristotle:** Staff

**CLAS 5605 Advanced Seminar on Neoplatonism:** Staff

**CLAS 5606 Greek Philosophical Texts:** Staff

**CLAS 5607 Latin Philosophical Texts:** Staff

**CLAS 5608 Reading and Research:** Staff

**CLAS 5609B Greek Philosophical Texts:** J.P. Atherton

**Patristics**

**CLAS 5707 Readings in Patristic Texts:** Staff

**CLAS 5708 Reading and Research:** Staff

**CLAS 5900 Departmental Seminar:** Staff

**CLAS 5901 Reading and Research:** Staff

**CLAS 9000 Thesis (MA)**

**CLAS 9530 Thesis (PhD)**

**Economics**

**Location:** 6214 University Avenue  
Halifax, N.S. B3H 1X1  
**Telephone:** (902) 494-2026

**Chairperson of Department**

E. Klein

**Professor Emeritus**

Z.A. Konczacki, BSc (Lond.), B. Econ. Hons. (Natal), PhD (Lond.)

**Professors**

F.M. Bradfield, BComm (McM), PhD (Brown)  
R.L. Comeau, BA, MA (StFX), PhD (Brown)  
J.L. Cornwall, BA (Iowa), MSc (Lond.), PhD (Harv.), McCulloch Professor of Economics  
J.F. Graham, BA (UBC), MA, PhD (Col.), FRSC, Fred C. Manning Professor of Economics  
E. Klein, LLM (Buenos Aires), MSc (Dal), Dr. Rer. Pol. (Hamburg)  
C. Marfeld, Dr. Rer. Pol. (Berlin)  
R.I. McAllister, MA (Oxon.), MA (Cantab.), on leave 1989-92  
L. Osberg, BA (Hons) (Queen's), MPhil, PhD (Yale)  
U.L.G. Rao, MA, MSc (Andhra), PhD (W.Ont.)  
A.M. Sinclair, BA(Dal), MA/BPhil Oxon.), PhD (Harv)

**Associate Professors**

M.L. Cross, AA(Dawson Col), BA (Montana), MA(SFU), PhD(Texas A&M) Graduate Co-ord.  
S. DasGupta, BA (Calcutta), MA (Delhi), PhD (Rochester)  
D.Gordon, BA(Lethbridge), MA(Sask), PhD(UBC)  
B. Huber, BA, MA, PhD (Yale)  
B. Lesser, BComm (Dal), MA, PhD (Cam.)  
L. Mazany, BSFS (Georgetown), PhD (UBC)

**Assistant Professors**

P. Burton, BSc (Saskatchewan), MA, PhD (UBC)  
S. Phipps, BA Hons (U. Vic), MA, PhD (UBC)

**Special Lecturer**

T. Pinfold, BA, MA (W.Ont.), PhD (Minn.)

**MA Degree Programme**

**Admission Requirements**

MA programmes in Economics may be of one or two years duration. Entrance to a two-year MA programme requires a pass or General BA degree with a major in Economics and an average of at least 70% (B) at Dalhousie standards in the classes of Economics and related fields. A minimum of four classes in Economics beyond the introductory level, with content and level of work satisfactory to the Department, is required. These prerequisite classes

should include one full class in intermediate theory (equivalent to Dalhousie Economics 2220/2221) and a basic class in Statistics (equivalent to Dalhousie Economics 2228). A first-level Mathematics class (equivalent to Dalhousie Mathematics 1000A and 1010B or 1100) is also required.

Promising students who do not meet the entrance requirements for the two-year programme may be admitted to a Qualifying Year to permit them to bring their work up to full admissions standards.

Entrance to a one-year MA Programme requires that a student should have completed an Honours BA in Economics (or equivalent) with an average of at least 70% (B) at Dalhousie standards in classes in Economics and related fields. Normally this means completion of at least eight classes in Economics beyond the introductory level including classes in Economic Theory and Statistics, and classes which are substantially equivalent to those classes recommended in the field preparation year for the programme chosen below. Mathematics classes which are equivalent to Dalhousie Mathematics 1000A/B and 2030A are also required.

Applicants should also consult regulations 2., "Admissions Requirements," which includes regulation 2.1, "English Language Proficiency".

### Programme Choices

The department offers the MA in the following areas of specialization:

- Economic Theory
- Econometrics
- Labour Economics
- Public Finance
- Resource Economics
- Monetary Theory
- Industrial Organization
- Regional and Development Economics

Department approval is required for the programme of each student.

### Interdisciplinary Programmes

The Department of Economics participates with other Departments and Institutions in several such programmes. These include:

- African Studies
- Environmental Studies
- Health Evaluation Studies
- Urban, Rural and Regional Studies

Graduate students wishing to orient their studies in the direction of these interdisciplinary fields take some classes in the relevant area from offerings outside the Department and do their graduate thesis on related topics. The Department's approval of such a programme is required. Other special interdisciplinary programmes may be devised, with the Department's consent, to meet particular interests.

### Completion of MA Programme

Students must successfully complete the required and optional classes of their programme. Normally a course of study worth at least five (5) credits is required, including a thesis which must be submitted and approved by the Department.

## MDE Degree Programme (Master of Development Economics)

### Admission Requirements

The normal duration of the programme is two years; applicants with the equivalent of some graduate level training or a professional degree (such as MPA, MBA, LLB or MBS) may be eligible for a one-year programme.

Entrance to the two-year programme normally requires a Pass or General BA, BSc or BComm degree, with a minimum of two classes in economics beyond the introductory level, including one full class in intermediate theory and a basic class in statistics. A first-level mathematics class is also required. Promising students who do not meet these requirements might be admitted to a qualifying year or permitted to take missing classes within the time frame of the two-year programme. Students who excel in the qualifying year may be admitted to a one-year programme.

### Programme Choices

The MDE Programme permits students to follow one of two paths:

**The Canadian Studies Programme** concentrates on Canadian economic development, with comparative insights from other industrialized countries. Primary emphasis in the programme is placed on exploring problems of development in Canada's less developed regions, with special attention to the Atlantic Provinces. Regional development policy initiatives and strategies are stressed.

**The International Development Studies Programme** concentrates both on sectoral themes and on geographic regions. These include rural development, manpower planning, the role of state corporations, international trade and payments, import substitution policies, international and bilateral aid, health and environmental issues, and the problem of helping those in greatest need in Third World countries. Specific country experiences will be extensively drawn upon through links the University faculty has with West Africa, East Africa, Indonesia, Latin America, the Caribbean, China, and India.

For both programme options, students should select classes to achieve a blend of the following disciplines, when the programme is viewed in combination with their academic background upon entering the course of study: economics, political science, history, sociology. Students should also seek to develop basic skills: the ability to think

numerically and interpret data, the ability to apply economic logic to real issues, basic computer literacy, and a sensitivity to human behaviour and different cultures.

For students taking the Canadian studies programme option, electives in economics and related disciplines should reflect the regional development focus of this option and/or provide exposure to areas necessary to the student's proposed thesis work. For the International Development Studies programme option, elective courses should reflect the international development focus of the programme and/or areas relevant to proposed thesis work.

**Completion of MDE Programme**

Students in a full two-year programme normally must successfully complete seven full-credit classes plus thesis. In some cases, this number of classes may be reduced on the basis of advanced standing granted for previous work.

**PhD Degree Programme**

**Admission Requirements**

Applicants for admission to the PhD programme must have academic qualifications superior to those required for entrance into the MA programme. The minimum required for entry is an Honours Degree in Economics with an average of at least 80% (A-) by Dalhousie standards in the classes in economics and related fields. Students entering after completing the required course work for an MA degree in Economics would normally prepare for their PhD Comprehensive Exams in two years; those with only an Honours BA would normally require three years. Other specific requirements for entry depend upon the PhD programme chosen and are listed below.

Applicants may be required to submit the results of the Graduate Record Examination in Economics with their application. They should also consult regulation 2, "Admissions Requirements," which includes regulation 2.1, "English Language Proficiency."

**Programme Choices**

The department offers the PhD in the following areas of specialization:

- Economic Theory
- Microeconomics
- Macroeconomics
- Mathematical Economics
- Econometrics
- Industrial Organization
- Labour Economics
- Resource Economics

The specialization can be undertaken in one of two basic programmes: the General Programme or the Mathematical Economics Programme. Students admitted to a two year PhD programme may follow either programme, whereas students

admitted to a three year PhD programme may follow either programme after having satisfactorily completed a prescribed course of study during their first year. Departmental approval is required for the programme of each student.

The structures of the General and the Mathematical Economics programmes are described below.

**General Programme**

The General Programme is designed to provide students with a strong foundation in economic theory and quantitative methods and intensive work in two applied fields of economics. In addition to the entrance requirements above, students are expected to have completed classes, at a satisfactory level, in Intermediate Calculus, Matrix Algebra, Linear Algebra and Statistics (equivalent to Dalhousie Mathematics 2000, 2030 and 2040 and Economics 2228).

At the completion of their class work, candidates for the PhD in the General Programme will be examined in:

1. Macroeconomic and Microeconomic theory (at the level of Dalhousie Economics classes 5500A, 5509B, 6600B and 6609A, including applications of the economic theory described).
2. Two fields of specialization.
3. History of Economic Thought.

They are also required to show proficiency in Quantitative Analysis and Economic History in the course of their work. A course of study recommended for the two-year General Programme would include:

**Year 1:**

1. Economics 5500A (Macroeconomics theory)
2. Economics 5509B (Microeconomics theory)
3. Economics 5506 (Economic History)
4. One class in an applied field selected as the student's "major applied field"
5. One other class

**Year 2:**

1. Economics 6600B (Macroeconomic theory)
2. Economics 6609A (Microeconomic theory)
3. Economics 5533 (Econometrics)
4. A second class selected from the "major applied field"
5. One class in an applied field selected as the "minor applied field."

**The Mathematical Economics Programme**

The Mathematical Economics Programme provides students with the option of pursuing work leading to specialization in Mathematical Economics. In addition to the entrance requirements in (A) above, applicants for the two-year programme should have classes in Advanced Calculus, Matrix Algebra, Linear Algebra and Statistics (equivalent to Dalhousie classes Mathematics 2000, 2030, 2040 and

**Economics 2228).**

Students with combined Honours in Mathematics and Economics, or Honours in Mathematics and who have done (reasonable) undergraduate work in Economics may be accepted into the same course of study and be permitted to make up deficiencies during the first year of study.

At the completion of their class work students in the Mathematical Programme will be examined in General Economic Theory (including History of Thought); Mathematical Economics and one applied field.

A course of study recommended for the two-year programme would include:

**Year 1:**

1. Mathematics 3040 (half class); Metric Spaces and Elementary Topology, and Mathematics 4140 (half class); Introduction to Functional Analysis or
1. Mathematics 3300 (half class); Linear Integer Programming, and Mathematics 3310 (half class); Discrete and Dynamic Programming
2. Economics 6600B (half class); Economic Theory
3. Economics 6610; Mathematical Economics
4. One class in an applied field
5. One other class

**Year 2:**

1. Mathematics 4010; Measure and Integration Theory, Mathematics 3120 (half class); Differential Equations, or Mathematics 4300 (half class); Control Theory
2. Economics 6619 (half class) and Economics 6620 (half class); Seminars in Mathematical Economics and Economic Theory
3. Economics 5533; Econometrics
4. One class in the applied field selected in the first year.

**Examination and Thesis**

Comprehensive examinations consisting of written papers in economic theory and two fields, and oral examinations in the same three subjects, are required at the end of the required period of course work.

A suitable thesis must be submitted and defended. Students are required to make a public presentation of a thesis proposal no later than six months after completion of the comprehensives and preferably at some point prior to the comprehensives.

**Classes Offered**

Classes other than those listed may be offered. Not all classes listed are necessarily offered in any given year.

**ECO 5000A/B Economic Theory for MDE Microeconomics**

**ECO 5001A/B Economic Theory for MDE Macroeconomics**

**ECO 5238A The Industrial Revolution in Europe: P.B. Huber**

**ECO 5238B The European Economy in Historical Perspective: After the Industrial Revolution: P.B. Huber**

**ECO 5250 Applied Development Economics**

**ECO 5251C Seminar in Development Studies**

**ECO 5333A Theories of Economic Development: B. Lerner**

**ECO 5334B Economic Development: Recent Debates, Controversies and Conflicts**

**ECO 5336B Regional Development: Post-1945 Canadian and Industrial Countries' Economic Policy Experience: R.I. McAllister**

**ECO5350B Social Cost-Benefit Analysis: T.Pinfold**

**ECO 5431B International Payments: L. Mazany**

**ECO 5433B Intergovernmental Fiscal Relations: J.F. Graham**

**ECO 5500A Macroeconomics: J.L. Cornwall**

**ECO 5502A Monetary Theory: Microeconomic Aspects**

**ECO 5505 Public Finance**

**ECO 5506 North American Economic History: B. Lerner**

**ECO 5508 Government and Business: C. Marfels**

**ECO 5509B Microeconomics: S. DasGupta**

**ECO 5511A Regional Economics: Theories: F.M. Bradfield**

**ECO 5512B Regional Economics: Empirical Studies and Policies: F.M. Bradfield**

**ECO 5514B Monetary Theory - Macroeconomic Aspects: R.L. Comeau**

**ECO 5515 Labour Economics: L. Osberg**

**ECO 5516A Natural Resource Economics I: M.L. Cross**

**ECO 5517B Natural Resource Economics II: P. Burton**

**ECO 5521A Mathematics for Economists: S. DasGupta**

**ECO 5533 Econometrics: U.L.G. Rao**

ECO 5551A Special Topics in Monetary Policy

ECO 5552B Special Topics in Monetary Theory

ECO 5558 Special Topics in Industrial  
Organization: C. Marfels

ECO 5559 Special Topics in Labour Economics:  
L. Osberg

ECO 5563 Special Topics in Regional Economics:  
F.M. Bradfield

ECO 5570 Special Topics in Econometrics: U.L.G.  
Rao. 5572 Special Topics in International Trade:  
P.B. Huber

ECO 5575A Applied Statistics and Econometrics  
I: D.V. Gordon

ECO 5576A Applied Statistics and Econometrics  
II: D.V. Gordon

ECO 5600R Special Topics in Macroeconomics: J.  
Cornwall

ECO 5601A/B Special Topics in Macroeconomics:  
J. Cornwall

ECO 5620A Special Topics in Resource  
Economics: M. Cross

ECO 5621B Special Topics in Resource  
Economics: M. Cross

ECO 5659A/B Special Topics in Labour  
Economics: L. Osberg

ECO 5670B Special Topics in Econometrics: G.  
Rao

ECO 6600B Economic Theory: J.L. Cornwall

ECO 6609A Economic Theory: E. Klein

ECO 6610 Mathematical Economics: S. DasGupta  
and E. Klein

ECO 6619A Seminar in Mathematical Economics  
and Advanced Economic Theory I

ECO 6620B Seminar in Mathematical Economics  
and Advanced Economic Theory II

ECO 6680 Directed Reading

ECO 9000 MA Thesis

ECO 9530 PhD Thesis

Special Topics classes, not separately listed,  
will be arranged to provide for advanced work in  
the areas of specialization chosen by PhD

students. MA students with the appropriate  
backgrounds will also be admissible to such  
classes. Other classes than those listed may also  
be offered and certain of the classes listed are not  
necessarily offered on an annual basis.

## Education

Location: Education Building  
Old Arts Annex  
Halifax, N.S. B3H 3J5

Telephone: (902) 494-3724 - General Enquiries

Director, School of Education  
K.C. Sullivan

Graduate Secretary

Rose Pritzker

Tel: (902) 494-6508

Professor Emeritus

E.Z. Friedenberg, BA (Centenary), MA  
(Stanford), PhD (Chicago)

Professors

W.F. Hare, BA (Lond), MA (Leica), PhD (Tor.)

T. Laidlaw, BA, MEd (Calgary), PhD (Alberta)

J.D. Myers, BA, MA (Tor.), PhD (Edinburgh),  
Dean, Henson College

J.B. Roald, BEd (UBC), MA (Wash), EdD(UBC)

Associate Professors

A. Barton, BA, MA (Trinity)

R.N. Bérard, BA (Antioch.), MA (McM.), BEd  
(Dal), PhD (McM)

R. Gamberg, BA (Brandeis), MA (Illinois)

P. Keane, BA(Manch), MEd(Bristol), PhD (Bath)

J. Manos, BA, BEd (StFX), MEd (Calgary), PhD  
(Alberta) Coordinator MEd Programme

H.J. Murphy, BSc (St. Dunstan's), BEd (PEI),  
MEd, EdD (Virginia)

H.E. Poole, BA, MA, PGCE (Birm.), PhD (Tor.)

E. Ricker, BA, MEd (UBC), PhD (Tor.)

S.W. Semple, BA, Dip Ed (Syd.), MEd, EdD  
(Tor.) Coordinator, MA/PhD Programmes

S.S. Sodhi, BA, BT, MA (Punjab), Dip. Guid.  
(Delhi), BEd, PhD (Alta.)

K.C. Sullivan, BSc, BEd (Dal), MEd, PhD (Alta.)

M. Walton, BA, MA, PhD (UBC)

B.A. Wood, BA (Tor.), MEd (Ott), PhD (Ott)

W.A. Wright, BA(Mt.A), MA(McGill), PhD(Mont)

Assistant Professors

M. Crowley, BA (Miami), MAT (Johns Hopkins),

PhD (Maryland) - Coordinator BEd Programme

D.A. Manicom, BEd(McG), MEd(AIE), PhD(Tor)

Honorary Research Associate

J. Eaton, BSc (Acadia), PhD (Dal)

## Admission Requirements

Students are advised to consult the Faculty Regulations. Normal admission requirements are a first degree plus the BEd or its equivalent with at least second-class standing overall.

Applicants who are uncertain whether or not they possess the equivalent of the BEd should make inquiries of the School. A Faculty advisor is assigned to each student admitted to a degree programme. The advisor must approve all class selections.

## PhD Degree Programme

Full-time study only is permitted.

The School offers a programme based on the study of educational theory, policies and practices. The Foundations disciplines (i.e., the educational subdisciplines of the social sciences and humanities) provide the framework for the programme. Students may elect to examine educational theories, policies and practices through one or more of these disciplines.

Students must meet normal admission requirements for the Faculty of Graduate Studies. A Master's degree in Education or a cognate field is normally expected. In exceptional cases a student may be admitted with a Bachelor's degree in Education or an honours degree in a cognate field.

Degree requirements include a two or three-year residency (students entering with an acceptable Master's degree will be required to complete a two-year residency; those with an Honour's degree or equivalent will be required to complete a three-year residency); full time study; four to eight course credits or equivalent including Ed. 5800R; a reading knowledge of any language required for successful completion of doctoral research; Preliminary Examination, thesis, oral defence of thesis.

To qualify for the award of the PhD degree, the thesis must make a substantial original contribution to educational theory, either by discovery of new information, or by the original interpretation of known information, or both.

For further information see the current edition of the Graduate Source Book (available from the School).

## MA Degree Programme

Part-time study is permitted.

The MA degree in Education offers a programme which emphasizes research and writing, embodied in a thesis, together with a number of graduate classes. This programme would normally be followed by a student who intends to pursue studies at the PhD level, but it is open also to students seeking only a Master's degree based upon research, writing and course work.

The School offers programmes of study leading to the MA degree in the following areas:

Curriculum, Continuing Education, Educational Administration, Educational Psychology, Foundations of Education.

A minimum of five university graduate credits (including a thesis equivalent to two credits) is required. Education 5800R (Graduate Seminar) is compulsory for all first-year MA students in Educational Foundations, Curriculum, and Educational Administration. Particular areas of concentration may require specific classes, and class credits beyond the minimum equivalent of five university credits. Additional credits may also be prescribed when, in the view of the School the applicant's academic experience or proposed area of concentration warrants such. Students in residence must participate in weekly seminars sponsored by the School.

For further information see the current edition of the Graduate Source Book (available from the School).

## MEd Degree Programme

Part-time study is permitted.

The MEd is a course work degree which may include a project involving the practical application of educational ideas.

The School offers programmes leading to the MEd degree in the following areas: Curriculum, Continuing Education, Educational Administration, Educational Psychology, Foundations of Education.

A minimum of five university graduate credits is required. Particular areas of concentration may require specific classes, and class credits beyond the minimum equivalent of five university credits. Additional credits may also be prescribed when, in the view of the School, the applicant's academic experience or proposed area of concentration warrants such. A project may be required in some areas of concentration.

For further information see the current edition of the Graduate Source Book (available from the School).

## Areas of Specialization Leading to the Master's Degree

### 1. Educational Foundations

A course of studies in the humanistic and social scientific aspects of education, with either a single-discipline or multi-disciplinary emphasis.

Some classes may be taken in other departments of the University, e.g., Sociology and Social Anthropology, History, and Philosophy.

### 2. Educational Psychology

A programme designed for students with a special interest in psychological issues as they pertain to education. The programme includes courses in human development, personality and learning theory. Emphasis is placed on themes such as adolescence, gender issues and special education.



**3. Educational Administration**

A course of study of particular interest and relevance to students wishing to prepare for administrative and supervisory positions and for those interested in advanced studies in educational administration. The programme combines a solid theoretical base, a high degree of technical competence and a critical, analytical approach.

**4. Continuing Education**

This programme is intended to serve the needs of participants in the broad field of adult learning, from Basic Education to Continuing Professional Education. It offers a core course of studies, plus a variety of options, encompassing career interests in such fields as teaching, counselling, administration, adult literacy and community development.

**5. Curriculum**

This programme is designed to accommodate different student needs and interests related to curriculum in schools and other educational institutions. A student may choose to focus upon curricular theory and practice, in which case classes should be selected from among those which deal with the philosophy and theory of curriculum, critical analysis, design, and implementation. Alternatively, a student may elect to study the pedagogy of a particular discipline or subject field, in which case the classes chosen should deal with such matters as the structure of knowledge within the particular discipline or field, research on teaching, and so forth.

**Classes Offered**

Students should note that within the confines of their programme of study and with the approval of their advisor and the appropriate Coordinator they may elect to take classes from other areas or from other departments of the university. Students should consult the School about the availability of classes in any given term. Please Note: not all classes listed below are offered every year. Please check the Graduate Source Book for current listings.

**EDUC 5021A** The Development of a Progressive Curriculum in Canadian Public Schools, 1890-1914: A. Wood

**EDUC 5022B** The Development of a Progressive Curriculum in Canadian Public Schools, 1914-1940: A. Wood

**EDUC 5031A/B** Teachers, Their Organizations and Decision Making in Education: R. Béard

**EDUC 5061A/B** The History of Curricular Thinking: J.B. Roald

**EDUC 5101A/B** Advanced Studies in Philosophy of Education: W. Hare

**EDUC 5151A/B** Ethics and Education (crosslisted with Philosophy 5280): W. Hare

**EDUC 5162A/B** Open-Mindedness and Education (crosslisted with Philosophy 2810): W. Hare

**EDUC 5201A/B** Youth as a Social Category: A. Manicom

**EDUC 5221A/B** Higher Education and Social Policy: staff

**EDUC 5222A/B** Schools and Social Identity: A. Manicom

**EDUC 5223A/B** Criticism of Public Education: staff

**EDUC 5231A/B** Social Issues in the Curriculum: A. Manicom

**EDUC 5241A/B** Gender Relations: T. Laidlaw

**EDUC 5242A/B** Gender Issues in Education: A. Manicom

**EDUC 5250R** Advanced Seminar on the Family: T. Laidlaw

**EDUC 5251A/B** Educational Tradition and Change in Regional Context: The Soviet Realm: S. Semple

**EDUC 5252A/B** Comparative Perspectives on Issues in Education: S. Semple

**EDUC 5260B** Education and Development: staff

**EDUC 5291A/B** Multiculturalism and Education: E. Ricker

**EDUC 5301A** Human Learning: S. Sodhi

**EDUC 5302B** Cognition: S. Sodhi

**EDUC 5320R** Current Issues in Educational Psychology: J. Manos

**EDUC 5335A/B** Childhood into Maturity: H. Poole

**EDUC 5341A** Special Education Policy Decisions: S. Sodhi

**EDUC 5342B** Learning Disabilities: S. Sodhi

**EDUC 5350R** Contemporary Issues in Childhood Education: S. Sodhi

**EDUC 5360R** Theories of Personality: J. Manos

**EDUC 5362A Leadership Programming in Childhood Education:** H. Poole

**EDUC 5370R Developmental Psychology:** T. Laidlaw/J. Manos

**EDUC 5380R Psychology of Special Education: Resource Teachers:** S. Sodhi

**EDUC 5381A/B Introduction to Counselling:** T. Laidlaw

**EDUC 5382A/B Counselling Women:** T. Laidlaw

**EDUC 5391A/B Introduction to Educational Assessment:** J. Murphy

**EDUC 5392A/B Psychological Testing in Education:** J. Murphy

**EDUC 5401A Administration of Public Education in Canada:** E. Ricker

**EDUC 5402B Concepts in Educational Administration:** K. Sullivan

**EDUC 5411A Administration of Educational Personnel:** K. Sullivan

**EDUC 5412B Administration of Educational Programmes:** staff

**EDUC 5421A/B Politics of Education:** R. Bérard

**EDUC 5431A Education and Public Policy:** E. Ricker

**EDUC 5432B The Local Government and Administration of Education:** E. Ricker

**EDUC 5440A Contemporary Issues in Educational Administration: National and International Issues:** K. Sullivan

**EDUC 5441B Conceptual Analytical Skills for Educational Administration:** staff

**EDUC 5451A/B Philosophy and Educational Administration (cross-listed with Philosophy 2820):** W. Hare

**EDUC 5460B Law and the Schools:** staff

**EDUC 5462B Interest Groups in Education:** E. Ricker

**EDUC 5470R Local Government and Administration of Education:** E. Ricker

**EDUC 5471A/B Educational Finance:** staff

**EDUC 5481B The Use of Microcomputers in Educational Administration:** K. Sullivan

**EDUC 5484A/B Introduction to the Study of Teaching and Pedagogy:** B. Roald

**EDUC 5500R Curriculum:** A. Barton

**EDUC 5510R Approaches and Issues in Curriculum Design:** B. Roald

**EDUC 5520R Implementation of Curriculum:** M. Schoeneberger

**EDUC 5524R Issues in Curriculum Evaluation:** J. Murphy/B. Roald

**EDUC 5552B Organizing and Administering School Library Media Center Programs:** staff. (Consult School of Library and Information Studies.)

**EDUC 5560R Canadian and Maritime Studies in the Curriculum:** R. Bérard

**EDUC 5571B Foundations of Second-Language Teaching:** P. DeMeo. (Consult the French Department)

**EDUC 5573A/B Visual Pedagogy in Second Language Teaching:** J. Brown (consult French Department)

**EDUC 5601A/B Young Adult Literature and Media Interests:** (Consult School of Library and Information Studies.)

**EDUC 5612A/B Children's Literature and Media Interests:** (Consult School of Library and Information Studies.)

**EDUC 5624A/5625B New Directions in High School Math Curricula:** M. Crowley

**EDUC 5632A/B Collections Development:** (Consult School of Library and Information Studies.)

**EDUC 5633A Computers in Schools:** M. Crowley.

**EDUC 5635A/B Logo and Computer Based Learning:** M. Crowley

**EDUC 5637A/5638B Computers and Writing:** A. Barton

**EDUC 5650R Computer Lesson Writing:** A. Barton

**EDUC 5660R Geography in Education:** S. Semple

**EDUC 5670R New Dimensions for Curriculum in Geography:** S. Semple

**EDUC 5680R Science Curricula:** A. Barton

## 74 Education

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**EDUC 5800R Graduate Seminar:** staff

**EDUC 5801A/B Qualitative Research Methods:** A. Manicom

**EDUC 5802A/B Advanced Seminar in Qualitative Research:** A. Manicom

**EDUC 5811A Quantitative Research Methods:** J. Murphy

**EDUC 5821B Educational Statistics:** J. Murphy

**EDUC 5900R Foundations of Continuing Education:** P. Keane

**EDUC 5910R Education and Aging:** P. Keane

**EDUC 5920R Adult Vocational Education:** P. Keane

**EDUC 5921A Programme Design in Continuing Education:** P. Keane

**EDUC 5930R Continuing Professional Education:** P. Keane

**EDUC 5931A Critical Perspectives on Adult Learning and Teaching:** M. Welton

**EDUC 5932B Adult Education Methods:** M. Welton

**EDUC 5933A/B History of Adult Education:** M. Welton

**EDUC 5935A/B Twentieth Century Adult Education Thinkers:** M. Welton

**EDUC 5941A/B Adult Counselling**

**EDUC 5950A/B Comparative Studies in Continuing Education:** S. Scemple

**EDUC 5961A Adult Psychology:** S. Sodhi

**EDUC 5962B Adult Psychology:** S. Sodhi

**EDUC 5973A/B Community Education and Development:** M. Welton

**EDUC 5975R Selected Policy Issues in Continuing Education:** D. Myers

**EDUC 5977A Coping with and Managing Continuing Education Organizations Part I:** K. Sullivan

**EDUC 5978B Coping with and Managing Continuing Education Organizations Part II:** K. Sullivan

**EDUC5981A/B Issues in Adult Literacy:** R. Gamberg

**EDUC 5982A/B Adult Literacy Needs and Programmes:** R. Gamberg

**EDUC 5995R Special Topics in Adult Education:**

**EDUC 6000-6911 Reading Classes**

**EDUC 7985R Practicum: Theory and Practice of Literacy Acquisition for Adults:** R. Gamberg, open to independent completion of study

**EDUC 7990 Project - Educational Psychology:** Open to independent completion of study.

**EDUC 7991R Project - Curriculum:** Consult School, open to independent completion of study.

**EDUC 7992B Practicum in Continuing Education:** P. Keane, open to independent completion of study.

**EDUC 7993R Project - Educational Foundations:** consult School. Open to independent completion of study.

**EDUC 7994R Practicum: Creating the Educative Workplace:** M. Welton or R. Gamberg. Open to independent completion of study.

**EDUC 7998R Project - Educational Administration:** Open to independent completion of study.

**EDUC 9000R MA Thesis**

**EDUC 9530R PhD Thesis**

## English

**Location:** 1434 Henry Street  
Halifax, N.S. B3H 3J5  
**Telephone:** (902) 494-3384

### Chairperson of Department

M.M. Farrow

### Professors Emeritus

J. Gray, MA (Aberd.), MA (Oxon), PhD (Mont.),  
FRSA, FRSC, McCulloch Professor of English  
M.M. Ross, OC, BA (UNB), MA (Tor.), PhD  
(Corn.), DLit (UNB), DSL (Trinity Col), LLD  
(St. Thom.), LLD (Dal), DLit (Trent), FRSC  
S.E. Sprott, MA, BD (Melb.), PhD (Col.)

### Professors

J. Fraser, MA (Oxon.), PhD (Minn.), George  
Munro Professor of English Language and  
Literature  
R.M. Huebert, BA (Sask.), MA, PhD (Pitt.)  
A.E. Kennedy, BA, MA (UBC), PhD (Edinburgh)  
M.A. Kling, BA(Minn), MA (Kans. St.), PhD (Ill.)  
P.Monk, BA(Reading), MA(Carl.), PhD(Queens)  
R.J. Smith, BA (Natal), MA (Oxon.), PhD  
(Natal), Dean Faculty of Arts and Social Sciences  
R.R. Tetreault, BA (UBC), MA, PhD (Cornell)  
D.F. Varma, MA (Patna), PhD (Leeds)  
J.A. Wainwright, BA (Tor.), MA, PhD (Dal.)

### Associate Professors

J. Baxter, BA, BEd, MA, PhD (Alberta)  
S.A. Cowan, BA (Montana), MA (Yale)  
R. MacG. Dawson, MA (Tor.), B.Lit. (Oxon.)  
M.M. Farrow, BA (Dal), MA, MPhil, PhD (Yale)  
B.R. Greenfield, BA (York), MA (McG), MPhil,  
PhD (Columbia)  
V.Li, BA, MA (UBC), PhD (Cantab)  
D. McNeil, BA (Conc), MA (UNB), PhD (McM)  
C.J. Myers, BA (Sask.), MA, PhD (Tor.)  
M. Stone, BA (Guelph), MA, MPhil (Waterloo),  
PhD (Tor.)  
H.S. Whittier, BA (U.S. Naval Acad.), MA (New  
Hamp.), PhD (Yale)

### Assistant Professors

L. Diepeveen, BA (Calv. Coll.), MA, PhD (Ill.)  
A. Higgins, BA (Connecticut), MA (McGill), MA  
(Mass), MA, PhD (Yale)  
C. Luckyj, BA, MA, PhD (Tor)  
H.E. Morgan, BA (UBC), MA (Wash.), B.Lit.  
(Oxon.), PhD (Wash.)  
J. Thompson, BA (Western), MA, PhD (Tor.)

### Lecturer

A. Dowdall, BA, MA (Carleton)

### Adjunct Professor

R.L. Raymond, BS (Yale), MA (Tor.)

Applicants should designate the proposed thesis area at the time of application for admission. The Department will entertain research proposals at the MA level in most areas of British, Canadian, or American literature, and at the PhD level in many of these areas. Nonetheless, applicants for the PhD should take care to consult the Graduate Coordinator of the department concerning its strength, in both resources and personnel, in the field of study in which they propose to specialize.

## Admission Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. Candidates for the PhD degree in English must hold an MA degree from Dalhousie or its equivalent. Only in exceptional circumstances will persons holding a BA and an MA from Dalhousie be allowed to proceed to a PhD programme without study at another institution. It is recommended that all foreign students submit the necessary documents by February 15th.

## MA Degree Programme

For minimum time required to complete this programme, see Section 6.

Two graduate seminars in English, one in the thesis area and one in an area unrelated to the thesis, and a third seminar in English, or, with the approval of the Department, a class in another department relevant to the candidate's course, are required.

All students are required to have studied at least one European language other than English and to demonstrate some proficiency in it.

A thesis, equivalent to two classes, is required.

Two unbound copies of the thesis are to be submitted to the Department at least two weeks before the deadline dates set by the Faculty of Graduate Studies.

## PhD Degree Programme

For a minimum time required to complete this programme, see Section 6.

Three graduate seminars beyond the classes for the Dalhousie MA are required. A qualifying examination with written and oral portions is required.

All graduate students in the Department are required to have studied at least one European language other than English, and to demonstrate some proficiency in it. In addition to this general requirement, each doctoral thesis area has its own specific language requirements.

Preparation and defence of a thesis are required.

**Classes Offered**

**Graduate Seminars**

Approximately ten full-year seminars or the equivalent are offered each year. Students should consult the Department about which of the following seminars will be offered in 1991-92.

ENGL 5110R Middle English Literature: M. Furrow, H. Morgan

ENGL 5115R Medieval Romance: H.B. Morgan

ENGL 5120R Early English Drama: A. Higgins

ENGL 5220R Shakespeare: J. Baxter

ENGL 5225A/B Shakespeare Studies: R. Huebert

ENGL 5230R Renaissance Poetry and Rhetoric: J. Baxter

ENGL 5235A Milton's Paradise Lost: R. Huebert

ENGL 5237R Gender in English Renaissance Drama: C. Luckyj

ENGL 5250R Renaissance Dissident Writers: R. Huebert

ENGL 5310R Restoration and Augustan Satire: J. Gray

ENGL 5315R The Eighteenth-Century English Novel: D. McNell

ENGL 5320R Samuel Johnson and His Circle: J. Gray

ENGL 5325R Literature and Society, 1750-1800: J. Gray

ENGL 5330R The Gothic Romance: D.P. Varma

ENGL 5410R Innovation and Tradition in Romantic Poetry: R. Tetreault

ENGL 5411A/B Women and Men in the Romantic Era: R. Tetreault

ENGL 5415R Wordsworth and Coleridge: R. Tetreault

ENGL 5420R Keats and Shelley: R. Tetreault

ENGL 5421A/B Keats: R. Tetreault

ENGL 5422A/B Shelley: R. Tetreault

ENGL 5430R The Literature of Victorian Social Criticism: C.J. Myers

ENGL5435R Victorian Narrative Modes: M.Stone

ENGL 5510R Tradition/Illusion and Experimentation in English Poetry, 1880-1920: J. Fraser

ENGL 5515R Literature and Society, 1900-1920: J. Fraser

ENGL 5520R Joyce and Yeats: M.A. Klug

ENGL 5525R British Literature, 1920-1945: R.J. Smith

ENGL 5526A British Literature, 1920-30: R.J. Smith

ENGL 5527B British Literature, 1930-45: R.J. Smith

ENGL 5540R British Fiction Since 1945: R.J. Smith

5615R Modern Canadian Poetry: P. Monk

ENGL 5620R Modern Canadian Fiction: J.A. Wainwright

ENGL 5625A/B Studies in Modern Canadian Poetry: P. Monk

ENGL 5628R Poet as Novelist/Novelist as Poet in Modern Canadian Literature: A. Wainwright

ENGL 5630A/B Studies in Modern Canadian Fiction: J.A. Wainwright

ENGL 5710R Studies in Commonwealth Fiction: R.J. Smith

ENGL 5810R The American Scene: Major Figures of the Nineteenth Century: B. Greenfield

ENGL 5820R American Poetry 1910-1945: L. Diepeveen

ENGL 5825R A/B Recent American Fiction: M.A. Klug

ENGL 5910R Modern Critical Methods and Theories: A. Kennedy

ENGL 5915R Post-Structuralism: Criticism of Value: A. Kennedy

ENGL5920A/BDeconstructive Figures: A.Kennedy

ENGL 5925R Prose on the Margin: A Generic Approach to the Essay, the Short Story and the Novel: J. Gray

ENGL 9000 MA Thesis

ENGL 9530 PhD Thesis

**Honours Classes (Tentative list)**

**ENGL 0451A An Introduction to Literary Research**

**ENGL 3201 The English Language**

**ENGL 3202 History of the English Language**

**ENGL 3244 Literary Criticism**

**ENGL 4251 Sixteenth-Century Non-Dramatic Literature**

**ENGL 4252 Shakespeare and the Drama of His Time**

**ENGL 4253 Old English**

**ENGL 4254 Eighteenth-Century Literature**

**ENGL 4351 Middle English**

**ENGL 4352 Seventeenth-Century Non-Dramatic Literature**

**ENGL 4354 Victorian Novel**

**ENGL 4355 American Literature to 1900**

**ENGL 4356 Literature of the Romantic Period**

**ENGL 4357 Modern Canadian Literature**

**ENGL 4452 Nineteenth-Century Prose and Thought**

**ENGL 4453 Twentieth-Century British Literature**

**ENGL 4455 Modern American Literature**

**ENGL 4457 Victorian Poetry**

**Environmental Studies**

**Location:** 1312 Robie Street  
Halifax, N.S. B3H 3E2  
**Telephone:** (902) 494-3632

**Resource and Environmental Studies**

**Director of School**

G.E.E. Beanlands

**Associate Director**

R.P. Côté

**Academic Programme Coordinator**

F.G. Cohen

**Professors**

R. Apostle, BA (SFU), MA, PhD (Calif., Berkeley) Major appointment in Sociology and Social Anthropology  
R. Boardman, BSc, PhD (Lond.) Major appointment in Political Science  
W.H. Charles, BA (Sir Geo. Wms.), LLB (Dal), LLM (Harv), LLM (Mich) Major appointment in Law  
F. Cohen, BA, MEd (Harv.), PhD (Minn.)  
R.W. Doyle, MSc (Dal), PhD (Yale) Major appointment in Biology  
B. Freedman, BSc, MSc, PhD (Tor.) Jointly appointed with Biology  
E. Gold, BA, LLB (Dal), PhD (Wales) Major appointment in Law  
A.J. Hanson, BSc, MSc (UBC), PhD (Mich.)  
L. Kasdan, MA, PhD (Chic.) Major appointment in Sociology and Social Anthropology  
A. Kwapong, BA, MA, PhD (Cantab) Major appointment in Lester B. Pearson Institute  
P.A. Lane, MSc (SUNY Binghamton), PhD (SUNY Albany) Major appointment in Biology  
K.E. von Maltzahn, MS, PhD (Yale) Major appointment in Biology  
E.L. Mills, BSc (Carl.), MS, PhD (Yale) Major appointment in Oceanography  
J.G. Ogden III, MA (Tenn.), PhD (Yale) Major appointment in Biology  
D.J. Patton, BA (UNB), MA (Tor.), DBA (Indiana) Major appointment in Bus. Admin.  
K.W. Renton, BSc (Sir Geo. Wms.), PhD (McG) Major appointment in Pharmacology  
K.S. Wood, BA, MA (Oregon) Major appointment in Henson College of Public Affairs

**Associate Professors**

G.E.E. Beanlands, BSc, MSc (UNB), PhD (Dal)  
M. Binkley, BA, MA, PhD (Tor.) Major appointment in Sociology and Social Anthropology  
M.P. Brown, BA (Mt A), MA (Dal), PhD (Tor.) Major appointment in Public Administration  
M.L. Cross, AA (Dawson College), BA (Montana), MA (SFU), PhD (Texas A&M) Major appt Econ

D.H. Elliott, BA (Yale), PhD (Pitt.) Major appointment in Sociology and Social Anthropology  
R. Marchant, BSc, MD (Dal), DECH (Tor.), Dip. Tox. (Saak.) Major appointment in Community Health and Epidemiology  
L. Mazany, BSFS (Georgetown), PhD (UBC) Major appointment in Economics  
R.F. McCurdy, MPH, MSc (Minn.), PhD (TUNS) Major appointment in Pathology  
G.K. Muecke, BSc, MSc (Alta.), D.Phil (Oxon.) Major appointment in Geology  
D. VanderZwaag, BA (Calvin), MDiv (Princeton), JD (Arkansas), LL.M (Dal) Jointly appointed with Law

### Assistant Professors (Research)

C. Lamson, BA (Skidmore), MS (Simmons), MA (Memorial), MES (Dal)  
P. Stokoe, BSc (Dal), MSc, PhD (Stanford)

### Research Associates

A.G. Gray, BA, MES (Dal)  
J. Reade, BA (SMU), MLS (Dal)

### Honorary Adjunct Professors

R.F. Addison, BSc, PhD (Queens, Belfast), Department of Fisheries and Oceans  
T. Charica, BSc (Carl.), PhD (UBC), Saint Mary's  
P.J. Ricketts, BA (Nottingham), PhD (Southampton), Saint Mary's University  
P. Taschereau, BA (Sir Geo. Wsm.), MA (Acadia), PhD (Man.)  
J.H. Vandermeulen, BSc, MSc (Alta.), PhD (UCLA), Department of Fisheries and Oceans  
P.G. Wells, BSc (McG), MSc (Tor.), PhD (Guelph), Environment Canada

### International Programme Staff

S. Conover, AB (Oberlin), MSc (Yale), PhD (Dal) (Co-ordinator)  
J. Campbell, BA (Dal), MA, PhD (UC Irvine)  
P. Lawrence, BSc (Univ. of London)  
J. Leith, B Phys Ed (McMaster), MA (Guelph)  
B. Patton, BA (UNB), MA (McMaster), MLS (Indiana)

The School (formerly the Institute) offers a graduate programme leading to the Master of Environmental Studies (MES) degree.

The core faculty of the School is small. It is complemented by cross-appointed faculty whose major appointments are in other units within Dalhousie, at other universities, or in government agencies.

There are two general MES options: (1) resource management and ecology with specialization in fields such as fisheries, forest and land management, environmental toxicology and (2) environmental policy and administration (for example, ocean and coastal zone management, environmental assessment). Classes in Environmental Studies are offered through the

school. In addition, a wide selection of classes relevant to the programme are given by other units within Dalhousie, and by Saint Mary's University and the Technical University of Nova Scotia. Students take core courses from which they will acquire a broad, interdisciplinary background in environmental studies. Each student will also take classes and write a thesis in a particular field of interest. An important element in the MES programme is group research projects which give the students experience in multidisciplinary team work. There are opportunities for study and research from the points of view of policy, technique and science. More than 20 faculty members from various academic units in the university contribute in class work and as thesis supervisors.

### Admission Requirements

In order to be enrolled in an MES programme students must have achieved sufficient depth of knowledge in an appropriate branch of an approved academic discipline.

- (a) The minimum entry requirement is (i) an Honours bachelor degree in a life science, an earth science, chemistry, physics, mathematics, economics, political science or sociology, or (ii) a professional degree in law, architecture, medicine or engineering, or (iii) equivalent academic qualification.
- (b) Students with a pass degree may gain admission by completing an additional year, with suitable academic standing, in an approved qualifying programme registered in the Faculty of Graduate Studies. This programme would direct the student into intensive study of one of the disciplines specified in (a) and would normally bring the student to the academic level of a Dalhousie Honours graduate.

Priority consideration for admission and financial assistance will be given to applications received by 31 March.

### Programme Duration and Minimum Requirements

- (a) The one-year programme: (Note: one year is understood to mean one full academic year, not one winter session.) Only students with a well-rounded background may enter a one-year MES programme. A "well-rounded background" is defined as an acceptable professional degree, e.g. BEng or BArch with a concentration in environmental studies. Professional experience following honours graduation may be taken into consideration when evaluating entrance requirements. The requirements for the one-year programme are:

1. ES 5000R and 5001B
2. One graduate-level class related to an environmental theme in the student's area of specialization.
3. Thesis

(b) **The two-year programme:** For all other students the minimum programme will occupy two years. Those accepted with an Honours bachelor degree, or a professional degree without environmental content, are required to complete, not later than the end of their first year, three half-credit classes selected from the disciplines of life sciences, earth sciences, chemical and physical sciences, engineering (group A), and social sciences, law, architecture (group B). An approved class in statistics as related to the environment may be accepted in either group A or B.

Students whose specialization was in group A should take at least two subjects in group B, and vice versa. Each credit must be in a different discipline and must be in subjects other than the major subject of the student's first degree. The approved classes from which these three half-credits may be selected will include a meaningful introduction to environmental questions as related to the discipline. In total, 11 half-credit courses and a thesis are required. During the first year of a two year programme, students will generally complete the following requirements:

1. Three half-classes specified above
2. ES 5000R and 5001B
3. An approved graduate class in an area designed to relate the undergraduate major to an environmental theme
4. ES 5110A (or appropriate alternative)
5. ES 5200B (or appropriate alternative)

The requirements for the second year of a two-year programme are:

1. ES 5002A
2. An approved graduate level class
3. ES 9000 (Thesis)

Class work beyond the minimum load is generally required and is specified by the programme coordinator after discussions with the student and thesis supervisor.

## Classes Offered

All classes except ES5002A and ES9000 are open to students in other programmes by permission of the instructor.

**ES 5000R Introduction to Environmental Studies:** F. Cohen and staff

**ES5001B Environmental Assessment:** G.Beanlands

**ES 5002A Environmental Studies Joint Project:** R. Côté

**ES 5004A/B Management of Toxic Substances:** R.Côté

**ES 5006A Environmental Toxicology:** B. Freedman, P. Wells

**ES 5020A Resource Systems and Economic Development:** A.J. Hanson. (Cross-listed with Biology 4650A/5650A)

**ES 5021B Fisheries Resource Management:** staff

**ES 5030A/B to 5039A/B Special Topics in Resource and Environmental Studies:** staff

**ES 5100R Applied Economics:** F. Siddiq (Cross-listed with MPA 5130R)

**ES 5110A Resource Economics:** M. Cross (Cross-listed with Economics 5516A)

**ES 5120B Environmental Ecology:** B. Freedman (Cross-listed with Biology 5060B)

**ES 5180A Coastal Communities:** M. Binkley (Cross-listed with SSA 5220A)

**ES 5200A/B Introduction to Environmental Law:** Staff. (Cross-listed with Law 2104/2105 A/B)

**ES 5601A/B Management of the Marine Environment:** J. Vandermeulen

**ES 5300A Natural Resources Administration:** P. Pross. (Cross-listed with MPA 6530A, Political Science 5266A)

**ES 9000 Thesis**



## French

**Location:** 1315 LeMarchant Street  
Halifax, N.S. B3H 3J5  
**Telephone:** (902) 494-2430

**Chairperson of Department**  
M. Bishop

### Professors

M. Bishop, BA, BEd, (Manch.), MA, (Man.), PhD (Kent. Canterbury)  
J.W. Brown, AB(Miami), MA(Middlebury), PhD (Penn)  
B.E. Gesner, BA, BEd, MA (Dal), Dr. de 3e cycle (Toulouse II)  
W.T. Gordon, BA, MA, PhD (Tor.)  
R. Kocourek, State Examination, PhD, CSc, (Charles U., Prague) Graduate Coordinator  
D.W. Lawrence, BA, MA, PhD (Lond.)  
H.R. Runte, MA, MPh, PhD (Kansas)  
M. Sandhu, Licence ès Lettres (Montpellier), PhD (Yale)

### Associate Professors

H.E. Bednaraki, BA(Lond), MA(Dal), PhD(Laval)  
P. De Méo, BA, MA, PhD (UCLA), Coordinator of MAT programme  
M.J. Myers, DUEL, Licence ès Lettres, MA, Dr. de 3e cycle (Strasbourg)  
L.Z. Oore, BA (Tel-Aviv), MA (Waterloo), PhD (Western Ontario)  
N. Trèves, BSc (Amer. U., Cairo), PhD (Rice)  
K. Waterson, BA(Long Is.), MA (NYU), PhD (CUNY)

### Assistant Professors

R. Bonnel, Licence (Paris), MA (Essex), Dr. de 3e cycle (Paris)  
T.P. Carter, BA (Prin.), MA, PhD (Brown)

### Honourary Adjunct Professor

R. Runte, BA (SUNY), MA, M.Ph., PhD (Kansas), Glendon College, York Univ.

## MAT Degree Programme

This degree programme, jointly administered by the French Department and the School of Education is a professional degree designed for the practising teacher. It may be taken full-time or part-time.

MAT classes are normally offered in the late afternoon during the Fall and Winter terms. Every effort is made to offer one or two half-credit classes during the summer sessions.

Coursework is evenly divided among the following four areas: French linguistics, francophone culture, second-language acquisition and teaching, and education. An independent project, supervised by members of the French

Department and the School of Education, will focus on the application of some aspect of current research in second-language learning to a specific pedagogical situation. Students primarily interested in research on second-language pedagogy should consider doing an MA in French rather than an MAT.

Please contact the MAT Coordinator for information about courses applicable to this degree programme.

## Admission Requirements

BA in French with Honours and BEd from Dalhousie or the equivalents. Prospective students must show evidence of proficiency in spoken and written French. Students with less than the above may be provisionally accepted into the programme and required to complete such additional classes as the Department feels warranted.

## MA Degree Programme

(For general rules see the Faculty Regulations above.)

Classes and research leading to the MA degree in French are offered in the areas of French literature, linguistics, second language studies and culture. Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies and must show evidence of proficiency in spoken and written French.

Students may be accepted on a full-time or a part-time basis. A full-time student must spend a minimum of one year in full-time graduate study. In the first year of residency, a full-time student is carrying more than two full-credit classes. The time normally required to complete the full-time programme is one year for holders of a French Honours degree or equivalent, and two years for holders of a general degree.

In a one-year full-time programme, the equivalent of at least five university credits is required. This will consist of thesis (usually equivalent to two credits) plus three 5000-level credits. In a two-year full-time programme, students have to attain the equivalent of Honours status (see Undergraduate Calendar) and to obtain the additional five credits as required in a one-year full-time programme.

In addition to the five credits, all MA students are normally expected to take a half-year class in Research Methods. When appropriate, up to one additional undergraduate or graduate credit may be required in order to improve the student's proficiency in French. A one-year full-time programme corresponds to three years part-time. A two-year full-time programme corresponds to six years part-time.

The thesis, written in French, is to be submitted and approved within five years from the first time of registration in the full-time programme (within six years for part-time study).

Students who wish, eventually, to go on to the PhD are advised to do this MA thesis degree.

## PhD Programme

(For general rules see the Faculty Regulations above.)

The admission requirements are as follows: an MA thesis degree in French, an excellent French oral and written proficiency, a scholarly interest in one of the areas of French Studies to which PhD thesis research is limited. These areas are: Twentieth Century Literature (Includes contemporary literature, poetry, poetics, structural stylistics, and selected novelists and playwrights), Linguistics (Includes lexicology and its modern history, lexical formation, semantics, text linguistics, contrastive studies, and terminology), and Contemporary Acadian Studies.

The requirements after admission are the following: two years of Dalhousie residency, four full graduate credits (from the departmental offerings in the years of residency), a second language examination (within two years after admission), preliminary and comprehensive written and oral examinations (not less than one year prior to submission of thesis), and the PhD thesis (normally written in French) and its oral defence.

### Selection of Classes and Registration

It is the responsibility of students admitted to one of the graduate programmes to report to the graduate coordinator or MAT coordinator in the week preceding the beginning of classes, or earlier. The purpose is a pre-registration briefing and interview, the final selection of classes, completion of class selection forms and the drawing up of the programme of graduate studies. All graduate students should be duly registered before classes begin.

### Classes Offered

What follows is a list of PhD, MA and MAT classes. Classes required in particular cases will be specified in each student's Programme of Graduate Studies. Only a limited number of classes is offered in any given year. Descriptions of the graduate classes offered in a particular year will be made available to students.

FREN 5002A/5002B/5002C Méthodes de recherche/ Research Methods: H. Runte and staff

FREN 5005A/5005B Philologie française: Séminaire d'ancien français/French Philology: Old French Seminar: H. Runte

FREN 5006A/5006B Philologie française: Séminaire de l'histoire du français moderne/French Philology: Seminar on the History of Modern French: H. Runte

FREN 5016A/5016B Aspects de la traduction/Topics in the Science of Translating: W.T. Gordon

FREN 5040R Stylistique avancée/Advanced Stylistics: M. Sandhu

FREN 5120R Linguistique/Linguistics: R. Kocourek  
FREN 5121A/5121B Fonctionnalisme et structuralisme en linguistique/ Functionalism and Structuralism in Linguistics: R. Kocourek

FREN 5122A/5122B Créativité Lexicale/Lexical Creativity: R. Kocourek

FREN 5123A/5123B Langue et terminologie savante/Learned Language and Terminology: R. Kocourek

FREN 5124A/5124B Vocabulaire et Culture/Vocabulary and Culture: R. Kocourek

FREN 5125A/5125B Sémantique/Semantics: W.T. Gordon

FREN 5140A/5140B Dialectologie acadienne et sociolinguistique/Acadian Dialectology and Sociolinguistics: B.E. Geaner

FREN 5180A/5180B Linguistique de texte/Linguistics of Texts: R. Kocourek

FREN 5185A/5185B Les Métaphores dans les textes/Metaphors in Texts: R. Kocourek

FREN 5190A/5190B La Linguistique du français enseigné/Linguistics in Teaching French: R. Kocourek

FREN 5250A/5250B Fondements de l'enseignement des langues secondes/Foundations of Second Language Teaching: P. De Méo

FREN 5260A/5260B Approches communicatives de l'enseignement du français langue seconde/ Communicative Approaches to French Second-Language Teaching: P. De Méo

FREN 5270A/5270B Enseignement de la lecture en français langue seconde/ Teaching of Reading in French as a Second Language: P. De Méo

FREN 5280A/5280B Enseignement de la culture francophone/Teaching of Francophone Culture: staff

FREN 5281A/5281B Culture française/French Culture: J. Brown

FREN 5285A/5285B Sémiotique appliquée/Applied Semiotics: J. Brown

## 82 French

**FREN 5290A/5290B** Analyse, exploitation et développement de matériels pédagogiques/  
Analysis, Exploitation and Development of  
Curricular materials: P. De Méo

**FREN 5295A/5296B** Séminaire: Didactique des  
langues secondes/Seminar: Second-Language  
Teaching: Staff, Topic varies, Consult Department  
for current year's topic.

**FREN 5300A** Séminaire: Littérature  
médiévale/Seminar in Medieval French Literature:  
H. Runte

**FREN 5301B** Lectures: Littérature  
médiévale/Supervised Readings in Medieval  
French Literature: H. Runte

**FREN 5400A/5400B** Rabelais et son  
temps/Rabelais and his Time: N. Trèves

**FREN 5401A/5401B** Montaigne et son  
temps/Montaigne and his Time: N. Trèves

**FREN 5402A/5402B** La Poésie de la Renaissance/  
Renaissance Poetry: N. Trèves

**FREN 5500A/5501B** L'Aventure intellectuelle du  
Grand Siècle/The Intellectual Adventure of French  
Classicism: K. Waterson

**FREN 5600A/5600B** Le roman épistolaire du 18<sup>e</sup>  
siècle/18th Century Epistolary Novel: R. Bonnel

**FREN 5700A/5700B** La Révolution  
romantique/The Romantic Revolution: M. Sandhu

**FREN 5701A/5701B** Le Roman du dix-neuvième  
siècle/ Nineteenth-Century Novel: M. Sandhu

**FREN 5705A/5705B** Le Poème en prose au 19<sup>e</sup>  
siècle/ The Prose Poem in the 19th Century: J.  
Brown

**FREN 5706A/5706B** Impressionnisme et  
symbolisme/ Impressionism and Symbolism: M.  
Bishop

**FREN 5800A/5800B** Le Théâtre de Camus et de  
Caillet/ The Theatre of Camus and Caillet: D.  
Lawrence

**FREN 5801A/5801B** Anti-romans du vingtième  
siècle/ Anti-Novels of the 20th Century: D.  
Lawrence

**FREN 5802A/5802B** La Poésie moderne de Char  
à Bonnefoy/Modern Poetry from Char to  
Bonnefoy: M. Bishop

**FREN 5803A/5803B** La Littérature  
Contemporaine I/ Contemporary Literature I: M.  
Bishop

**FREN 5804A/5804B** Art et Littérature/Art and  
Literature: M. Bishop

**FREN 5805A/5805B** La Stylistique  
structurale/Structural Stylistics: J. Brown

**FREN 5806A/5806B** Poétique et théorie de la  
littérature/ Poetics and Theory of Literature: J.  
Brown

**FREN 5807A/5807B** Culture contemporaine/  
Contemporary Culture: M. Bishop

**FREN 5808A/5808B** La Littérature  
Contemporaine II/ Contemporary Literature II: M.  
Bishop

**FREN 5876A/5876B** Aspects de la Littérature du  
Canada français/Studies in French Canadian  
Literature: B. Bednarski

**FREN 5877A/5877B** Analyse de textes littéraires  
québécois/ Analysis of Quebec Literary Texts: L.  
Oore

**FREN 5910A/5910B** Lecture de textes académiques  
contemporains/Supervised Readings in Acadmic  
Literature since 1968: H. Runte

**FREN 5920A/5920B** Femmes écrivains et images  
de femmes dans la littérature française à travers  
les siècles/French Women Writers and Images of  
Women through the Centuries: N. Trèves

**FREN 5990R** Projet indépendant/ Independent  
Project  
(MAT): Subject to independent completion of  
study.

**FREN 5996A/5997B** L'Oeuvre romanesque de  
Jean Gloux/ The Novels of Jean Gloux: D.  
Lawrence

**FREN 5998A/5999B** Recherches indépendantes/  
Independent Research: Subject to approval by  
graduate coordinator and department chairperson.

**FREN 9000R** Thèse/Thesis

## Geology

**Location:** Life Sciences Centre  
1355 Oxford Street  
Halifax, N.S. B3H 4J1  
**Telephone:** (902) 494-2358

**Chairperson of Department**  
Patrick J.C. Ryall

**Graduate Coordinator**  
R.A. Jamieson

**Professors Emeritus**  
H.B.S. Cooke, MSc, DSc (Witwatersrand)  
C.G.I. Friedlaender, PhD (Zurich)

**Professors**  
D.B. Clarke, BSc, MA (Tor.), PhD (Edin.)  
J.M. Hall, BSc (Wales), PhD (Lond.), DIC (Lond.)  
R.A. Jamieson, BSc (Dal.), PhD (MUN)  
F. Mediolì, PhD (Parma) (on leave)  
P.H. Reynolds, BSc (Tor.), PhD (UBC) (Jointly with Physics)  
P.T. Robinson, BSc (Mich.), PhD (Calif.)  
P.E. Schenk, BSc (W.Ont.), MSc, PhD (Wisc.)  
M. Zentilli, BSc (Chile), PhD (Queen's)

**Associate Professors**  
R. Boyd, BSc, PhD (Sydney)  
M.R. Gibling, BA (Oxon.), PhD (Ottawa)  
G.K. Muecke, BSc, MSc (Alta.), DPhil (Oxon.)  
P.J.C. Ryall, BSc (Dal), MSc (Alberta), PhD (Dal)  
D.B. Scott, BSc (Wash), MSc (Wash St), PhD (Dal)

**Assistant Professors**  
N. Culshaw, BA (Univ. of Keele), PhD (Ottawa)

**Senior Instructor**  
P. Wallace, BSc, MSc (McMaster)

**CIDA/NSERC Research Fellow**  
S.O. Akande, BSc (Ibadan), MSc (Western), PhD (Dal)

**Research Associates**  
C. Beaumont (Major appointment in Oceanography Department)

**Honourary Research Associates**  
S. Barr, BSc (UNB), PhD (UBC), Acadia Univ.  
J. Dostal, BSc (Charles), PhD (McMaster), St. Mary's Univ.  
P.R. Hill, BA (Oxon.), PhD (Dal), Atlantic Geoscience Centre  
A.J. Hurford, BSc (Kingston Polytechnic), PhD (London), University College of London  
L.F. Jansa, BSc, MSc (Masaryk), PhD (Charles), Atlantic Geoscience Centre, Energy, Mines & Resources

C.E. Keen, BSc/MSc (Dal), PhD (Cantab), Atlantic Geoscience Centre, Energy, Mines & Resources  
J. Malpas, BA, MA (Oxon), MSc, PhD (MUN), Memorial Univ. of Newfoundland  
R. Parrish, BS (Middlebury), MSc, PhD (UBC), Geological Survey of Canada  
D.J.W. Piper, BA Hons. (St. Catharine's Coll., Cantab.), MA (Cantab), PhD (Darwin Coll., Cantab.), Atlantic Geoscience Centre, BIO  
C.T. Schafer, BSc, MS, PhD (NY), Atlantic Geoscience Centre, Energy, Mines & Resources  
G. Villa, BSc (McMaster), MSc, PhD (Dal)  
M. Williamson, BSc, MSc (Wales), PhD (Dal), Atlantic Geoscience Centre, BIO

**Honourary Adjunct Professors**  
F.M. Gradstein, BA, MSc, PhD (Utrecht U.), Atlantic Geoscience Centre, BIO  
P.A. Hacquebard, BSc, MSc (Leiden), PhD (Groningen), LLD (Dal)  
P.J. Muddle, BSc (Cape Town), BSc (Leicester), PhD (Dal), Atlantic Geoscience Centre  
M.H. Sallabury, BSc (MIT), MSc, PhD (Wash.)

**Killam Postdoctoral Fellow**  
W. Kuhnt, BSc, MSc, PhD (Tübingen)

Students with good degrees in any of the sciences or mathematics who wish to study some aspect of the earth are welcome. Graduate work leading to the degrees of MSc and PhD is possible in a number of different fields. These include for example: marine geology and geophysics, Appalachian geology, isotope geology, economic geology, petrology, geochemistry and mineralogy, geophysics, sedimentology, micropaleontology and coastal sedimentation, structural geology, metamorphism, and tectonics.

Interdisciplinary studies are encouraged, and there is active cooperation among the science departments (including Oceanography) at Dalhousie University. Students are urged to take full advantage of the opportunities this affords. Research, on scientific problems of mutual interest to Dalhousie and government laboratories such as the Nova Scotia Department of Mines and Energy, Nova Scotia Research Foundation and the Atlantic Geosciences Centre at the Bedford Institute of Oceanography, is often done. Members of these laboratories frequently serve on supervisory committees.

The complex of departments and laboratories in Halifax and Dartmouth concerned with various aspects of the earth make graduate study in earth sciences very attractive.

## Admission Requirements

Candidates must satisfy general requirements for admission to the Faculty of Graduate Studies. Candidates seeking financial support should ensure that their applications are complete by February 15.

**MSc Degree Programme**

The minimum time for completion of the MSc degree is 12 months of full-time study (see Faculty Regulation 6.). Experience has shown that most students take more than 24 months to complete their work. Financial support is available for no more than 24 months.

Part-time study is also possible. Students must complete course requirements within 4 years, and all degree requirements within 6 years of registration for the first time. Conditions for admission to this programme are the same as those for full-time students. Financial support is not normally available for part-time study.

The equivalent of 5 graduate classes are required, of which the thesis normally counts as 3.

Graduate students are required to participate in the presentation of papers in the Geology seminar.

Research and preparation and oral defence of a thesis are required.

**PhD Degree Programme**

The minimum time required to complete this programme is two years from an MSc; normally three years are required (see Section 6.).

For coursework required, see Section 10.2. The preliminary examination (see Section 11.) involves presentation of a thesis proposal to the Department.

Students must demonstrate ability in one language other than English. Participation in the Geology seminar is required.

Research and preparation and oral defence of a thesis are required.

**Classes Offered**

The following classes are designed primarily for undergraduates in their final year; they may be taken by graduate students for general interest, because the material is needed to help in their research, or because the student's background may be inadequate. Classes marked \* are given only as numbers warrant. Classes marked + are given in alternate years.

GEOL 5150R Economic Geology: M. Zentilli

GEOL 5270A Applied Geophysics: P.J.C. Ryall

GEOL 5280B Marine Geophysics: K. Louden (Ocean.)

\*GEOL 5290B Geodynamics: C. Beaumont (Ocean.)

GEOL 5350A Tectonics: J.M. Hall

GEOL 5380A Advanced Geochemistry: G.K. Muecke

+GEOL 5390B Advanced Igneous Petrology: D.B. Clarke

+GEOL 5400B Advanced Metamorphic Petrology: R.A. Jamieson

The following classes are designed specifically for graduate students.

\*GEOL 6100C Seminar in Sedimentology and Stratigraphy

\*GEOL 6110C Research Topics in Micropaleontology

GEOL 6120A/6220B Seminar in Mineralogy, Petrology and Geochemistry

\*GEOL 6150C Seminar in Geophysics

\*GEOL 6150R Metallogeny in Mineral Exploitation

GEOL 6160R Research Topics in Soft Rock Geology I

GEOL 6170R Research Topics in Soft Rock Geology II

GEOL 6250C Directed Studies

Both 6160R and 6170R are required for all graduate students specializing in sedimentology, stratigraphy, or micropaleontology.

All graduate students must be registered in one of:

GEOL 9000 MSc Thesis

GEOL 9530 PhD Thesis

**German**

Location: 1355 LeMarchant Street  
Halifax, N.S. B3H 3J5

Telephone: (902) 494-2161

**Chairperson of Department**  
H-G. Schwarz

**Professors**

F.W. Gaede, PhD (Freib.) McCulloch Professor,  
Graduate Coordinator

P. Michelsen, PhD (Gott.)

H-G. Schwarz, MA (Munich), PhD (McG)

**Associate Professor**

D.H. Steffen, PhD (Gott.)

**Assistant Professor**

E. Spence, MA, PhD (UBC)

**Visiting Professor (Spring 1991)**

K. Kanzog, Dr.phil.(Berlin), Dr.habil.(Munich)  
University of Munich

Graduate classes leading to the degree of MA are offered in the history of German literature and thought. Research in the Department is concerned principally with the Baroque Age, the literary and philosophical tradition of German Idealism, and the culture of the twentieth century.

Graduate students may concentrate their work in any of the periods or in any particular aspect of the history of German literature and thought.

**Admission Requirements**

Applicants who do not meet the standards of an Honours degree may be required to take additional classes.

**MA Degree Programme**

Candidates should be prepared to spend two academic years towards completion of their classes and thesis.

Candidates are expected to have a reading knowledge of a third modern or ancient language. A thesis is required.

**Classes Offered**

GER 5500R Literature and Thought from Reformation to Enlightenment

GER 5520R Goethe and the Enlightenment

GER 5530R Hegel's Aesthetics and the Ancients

GER 5540R Kant and the History of German Idealism

GER 5550R Hegel: Phenomenology of Spirit

GER 5570R Goethe and Romanticism

GER 5580R Goethe's Faust

GER 5590R Studies in German Idealism

GER 5600R Heidegger and German Idealism

GER 5610R Literature of the 19th Century

GER 5620R Modern German Literature

GER 5630R Aesthetic Theory

GER 5640R Ancient and Modern Dialectics

GER 5660R History and Theory of the German Novel

GER 5670R Hegel's Philosophy of Nature

GER 5700A Special Topics I

GER 5701B Special Topics II

GER 9000R Thesis

**Health Services Administration**

Location: 1234 Seymour Street  
Halifax, N.S. B3H 3M3  
Telephone: (902) 494-7097

**Director of School**  
Lawrence J. Nestman

**Professors**  
L. Nestman, BComm (Sask.), CA (Alta.), MHSA (Alta.)

**Assistant Professors**  
G. Johnston, BSc Hons. (McGill), MHSA (Alta.), PhD (W. Ont.)  
K. Rondeau, BSc Hons, BLT (Regina), DIA, MA, MBA (Concordia)

**Associate Professors**  
M.G. Brown, BA (W Ont.), MA (Qu.), AM, PhD (Chic.)

**Lecturers**  
W.D. Cochrane, BA Hons, LLB (Dal)  
A.M. Macintosh, BA, LLB, (Dal), MPH (Harvard)  
A. Maxwell, BN, MPA (HSA) (Dal)  
D. McKillop, BA (York), MIR (Toronto)  
D.W. Rice, B.Eng., M.Eng., P.Eng. (TUNS)  
V. Hicks

Students seeking further information or help in planning courses of study in the School of Health Services Administration should address themselves to:

Graduate Coordinator  
School of Health Services Administration  
1234 Seymour Street  
Halifax, N.S. B3H 3M3  
(902) 494-7097

**Objectives**

The School of Health Services Administration offers a Masters degree which meets the needs of those pursuing administrative careers in the Canadian Health Care Delivery System. The Programme is designed to prepare individuals for careers in Hospital Administration, Nursing Administration, Long Term Care Administration,

Public and Community Health Administration and Administration in Municipal, Provincial and Federal Governments in health and health-related areas. Opportunities for individuals with an MHSA are excellent in policy, planning, evaluation, administration and research areas.

The Programme seeks to provide a conceptual background for the increasingly complex managerial tasks that need to be performed in health institutions and health related governmental departments. An effort is made to balance political, social, cultural, medical and psychological approaches to understanding the health care delivery system with those of the management sciences.

The emphasis in the programme is on an academic, multidisciplinary and professional education. It is academic in that it emphasizes knowledge of current research findings and treats the practice of health services administration as phenomena subject to social scientific analysis. It is multidisciplinary in that faculty are drawn from traditional social and administrative sciences. It is a professional programme in the sense that it will attempt to broaden the social perspectives of the student emphasizing the feature that a professional has a social responsibility to society and must have an appreciation of the ethical standards appropriate to a career in health services administration.

### Application Procedure

Application forms are available from the Admissions Office of Dalhousie University. Application should be submitted as early as possible to the Registrar's Office.

The following supporting documents are to be sent directly to the School:

- (a) transcripts of all previous work;
- (b) at least two letters of reference;
- (c) Resumé/Curriculum Vitae;
- (d) a statement of career interests and reasons for seeking admission to the School;
- (e) GMAT (see below);
- (f) TOEFL for Foreign Students (see below).

The application must be received by May 1.

Candidates are required to sit for the Graduate Management Admission Test (GMAT). This requirement may not be waived without explicit permission of the Admissions Committee. GMAT results will be considered with other information submitted by applicants, in deciding on eligibility for admission.

The Test may be taken at conveniently-located centres throughout North America and in many other parts of the world. In the case of North American candidates, applications for the test are accepted by the ETS in Princeton until approximately six weeks before test dates. For candidates in other countries, closing dates are eight weeks before test dates.

School of Health Administration GMAT

Number is 0690.

Applicants for the test should use an order form obtainable from the Registrar's Office of the nearest University, Dalhousie University, or you may write to the address below to obtain an information bulletin and registration form for the GMAT. If the order form is lost or omitted from the materials you receive, you should write directly to:

Graduate Management Admission Test  
Educational Testing Service  
Box 966  
Princeton, N.S., 08540, U.S.A.

Every student is required to demonstrate at an early stage in his studies that he is proficient in writing reports and essays in English. Candidates from countries outside Canada whose mother tongue is not English will be required to take the Test of English as a Foreign Language (TOEFL) as a requirement for admission and a minimum score of 550 must be achieved. Further information may be obtained by writing:

Test of English as a Foreign Language  
Box 899  
Princeton, N.S., 08540, U.S.A.

### CANDIDATES ARE ADVISED TO TAKE THE TEST(S) AT THE EARLIEST POSSIBLE DATE.

The deadline for applying to the School is May 1. For foreign students, it is strongly recommended that all documents (transcripts and references) be submitted prior to March 31.

### Course Requirements

The two-year programme leading to a Master of Health Service Administration degree features both an academic and results-oriented curriculum. It requires the successful completion of 9-11 credits which must include:

#### Required courses:

- MPA 5130A Applied Economics I
- MPA 5140A Quantitative Methods I
- MPA 5150A Financial Management & Accounting I
- MHSA 5300A Introduction to the Canadian Health System
- MHSA 5310B Health Institutional Management
- MHSA 5320B Epidemiology for Health Administration
- MHSA 5330A Organizational Behaviour in Health Services
- MHSA 5335B Information Systems in Health Administration
- MHSA 5340B Health Care Economics
- MHSA 5350B Health Services Accounting
- MHSA 6315A Organizational Theory for Health Services
- MHSA 6330A Health Care Planning
- MHSA 6380B Senior Seminar in Health Services
- MHSA 6390R Health Services Residency

6 half-credit courses must be chosen from the following courses:

- MHSA 6310C Health Care Policy
- MHSA 6311B Social Organization of Health Care
- MHSA 6312A Management Control & Funding Systems
- MHSA 6340A Human Resources in the Health Care Setting
- MHSA 6350A Economic Evaluation of Health Services
- MHSA 6360B Health Care Law
- MHSA 6365B Quality Assurance & Risk Management
- MHSA 6370B International Health
- MHSA 6375B Health Care Marketing
- MHSA 6394A/B/R Directed Project (full or half credit)
- MHSA 6395A/B/R Directed Reading (full or half credit)
- MHSA 6500A Intermediate Statistics for Health Services

1 full credit - graduate electives:

The remaining one-credit requirement may be made up from any of the courses offered by the School of Health Services Administration or any other graduate studies programme, subject to approval of a faculty advisor.

Students with an appropriate background may be admitted to a one-year programme

## Nursing Service Administration Concentration

The School of Health Services Administration, in cooperation with the School of Nursing, also offers a Nursing Service Administration Concentration in the Masters of Health Services Administration Programme. Graduates of this programme will be prepared to function as Administrators of Nursing Services. A student admitted to the MHSA Programme must declare his/her intention to take the Nursing Administration Concentration and meet with the Associate Director/Graduate Programme in Nursing by May 1st of the first year of study. Admission to this Programme will be limited to no more than 4 students per year.

Students with an appropriate background may be admitted to a one-year programme

This two-year Masters programme requires the successful completion of 9-11 credits which must include:

Required courses:

- MPA 5130A Applied Economics I
- MPA 5140A Quantitative Methods I
- MPA 5150A Financial Management & Accounting I
- MHSA 5300A Introduction to the Canadian Health System
- MHSA 5310B Health Institution Management
- MHSA 5320B Epidemiology for Health Administration

MHSA 5330A Organizational Behaviour in Health Services  
MHSA 5335B Information Systems in Health Administration

MHSA 5340B Health Care Economics  
MHSA 5350B Health Services Accounting  
MHSA 6380B Senior Seminar in Health Services  
MHSA 6390R Health Services Residency  
MHSA 6500A Intermediate Statistics for Health Services

N 5100A Research Methods I

N 5120B Research Methods II

N 5300A Theoretical Bases of Nursing I

N 5320B Theoretical Bases of Nursing II

1 credit: MHSA electives

1 credit: general graduate electives (subject to approval of a faculty advisor)

The programme can be completed on a full or part-time basis.

## Part time Study

The Programme offered through the School is available to students on a part time basis. A part time student may enrol in up to two full classes (or equivalent) in any one academic year.

In order to ensure that graduate students benefit from a reasonable concentration of their studies, part-time studies must normally be completed within six years.

## Further Information

Prospective applicants who do not meet the academic admission requirements of a graduate programme may wish to consider improving their qualification by means of a "Special" (no degree) programme or the Certificate in Public Administration in the Faculty of Management.

It should be emphasized that any such undertaking carries no assurance of subsequent admission to a graduate programme.

## General Admission Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. Enrolment in the School is limited. In general successful applicants should have attained a good second class standing in their previous university work.

Admission is based on an assessment of:

- professional experience and/or promise;
- all previous academic work;
- letters of reference;
- GMAT;
- TOEFL (when required)

In certain circumstances the School may consider applications from individuals who do not satisfy the general requirements for admission to the Faculty of Graduate Studies. Individuals with a minimum of ten years work experience in administrative positions who either have completed a full year of university study, or



possess a relevant professional certification or have completed a relevant correspondence programme (such as the Canadian Hospital Assoc. Health Services Management Course) can be considered for a special one year undergraduate course of study leading to a CPA. Successful completion of the year with an average grade of B<sup>+</sup>, with no grade below B-, would constitute a basis for a recommendation from the School for admission to the Faculty of Graduate Studies. Please direct enquiries to the Graduate Co-ordinator of the School in regard to the above.

### Advanced Standing & Exemption

Applicants wishing to receive advanced standing should include course outlines for those courses previously taken which they consider to be equivalent to Dalhousie MHSA courses.

Where it is determined at time of admission that a student has the equivalent of a required class but is not granted advanced standing, an exemption may be permitted, so that another class is substituted for the required class.

### Classes Offered

MPA 5130A Applied Economics I

MPA 5140A Quantitative Methods I

MPA 5150A Financial Management & Accounting I

MHSA 5300A Introduction to the Canadian Health System

MHSA 5310B Health Institution Management

MHSA 5320B Epidemiology for Health Admin

MHSA 5330A Organizational Behaviour in Health Services

MHSA 5335B Information Systems in Health Administration

MHSA 5340B Health Care Economics

MHSA6500A Intermediate Statistics for Health Serv

MHSA 5350B Health Services Accounting

MHSA 6311B Social Organization of Health Care

MHSA 6312A Management Control & Funding Systems

MHSA 6310C Health Care Policy

MHSA 6315A Organizational Theory of Health Serv

MHSA 6320A Managed Care

MHSA 6330A Health Care Planning

MHSA 6340A Human Resources in the Health Care Setting

MHSA 6350A Economic Evaluation of Health Services

MHSA 6360B Health Care Law

MHSA 6365B Quality Assurance & Risk Management

MHSA 6370B International Health

MHSA 6375B Health Care Marketing

MHSA 6380B Senior Seminar in Health Services

MHSA 6390R Health Services Residency

MHSA 6394 Directed Project

MHSA 6395 Directed Reading

Note: Not all classes are offered each year; consult the school for current year offerings. In addition to the above, classes may be selected from other schools, departments, or faculties, subject to the approval of a faculty advisor.

### History

Location: 1411 Seymour Street  
Halifax, N.S. B3H 3M6  
Telephone: (902) 494-2011

Chairperson of Department  
G.D. Taylor

### Professors

P. Burroughs, BA, PhD (Lond.), FR Hist S  
M.S. Cross, BA, MA, PhD (Tor.)  
J. Fingard, BA (Dal), MPhil, PhD (Lond.) Dean of Faculty of Graduate Studies  
J.E. Flint, MA (Cantab.), PhD (Lond.), FR Hist S  
H.S. Granter, BA (Dal), MA (Harv.)  
N.G.O. Pereira, BA (Williams), MA, PhD (U.C. Berkeley)  
L.D. Stokes, BA (Tor.), MA, PhD (Johns Hopkins)  
G.D. Taylor, BA, PhD (Penn.)  
M. Turner, BA, MA (Manc.), PhD (Lond.)  
P.B. Waite, MA (UBC), PhD (Tor.), FRSC (Prof. Emeritus)  
J.B. Webster, MA (UBC), PhD (Lond.)

**Associate Professors**

J.E. Crowley, AB (Princ.), MA (Mich.), PhD (Johns Hopkins)  
 J.T.O'Brien Jr., BA (Wisconsin), MA, PhD (Rochester)  
 J.L. Parpart, BA (Brown), MA, PhD (Boston)  
 D. Sutherland, BA (Mt. A.), MA (Dal), PhD (Tor.) Graduate Coordinator  
 D.R. Woolf, BA (Queen's), PhD (Oxford)

**Assistant Professors**

R. Bleasdale, BA, MA, PhD (Western Univ.) S.J. Brooke, BA (Dal), MA (McGill), D. Phil (Oxford)  
 G. Hanlon, BA, MA (Tor), PhD (Bordeaux)

**Admission Requirements**

Candidates for the one year MA degree must hold a BA Honours degree in history. Those with general history BA degrees or degrees in fields other than history may be placed in a two year MA programme or in a qualifying year programme. Candidates for doctoral study must hold an MA degree in history or in a cognate field.

**MA Degree Programme**

Students admitted into either a qualifying year or a two year MA programme must in the first year take five upper level undergraduate history courses and secure at least a B grade in each course before entering the one year MA programme. Students in the one year MA programme are required to attend and pass the Graduate Seminar which meets weekly during the academic year. In addition they must choose one of the two paths to the degree. The first path consists of preparing two fields (see below for the fields offered by the staff), passing written examinations in the two fields, and successfully defending a thesis not exceeding 50,000 words. The second path consists of passing two full-year graduate courses (or four half-year, or one full-year and two half-year graduate courses) and successfully defending a thesis of approximately 30,000 words.

Candidates writing theses in Canadian history must demonstrate a competent reading knowledge of French; those writing theses in other fields must demonstrate an adequate reading knowledge of the language required for the successful completion of their research.

**PhD Degree Programme**

For minimum time required to complete the programme, see Section 6.

In order to be considered a candidate for the PhD degree, students must prepare three fields, at least one of which must be outside the student's primary research area, and pass written and oral examinations in all three fields. Students must demonstrate an adequate reading knowledge of the language required for the successful completion of

their research. All students engaged in Canadian history research must demonstrate a reading competency in French.

A thesis is required which shall not exceed 100,000 words in length, excluding footnote references and bibliography. While students may offer fields in any of the areas listed below, doctoral theses are confined to Canadian, British and British Imperial, and African history topics.

To qualify for the award of the PhD degree, the thesis must make a significant and original contribution to historical study by the discovery of new information, or by the original interpretation of known information, or both.

**Fields for Graduate Study****Canadian History**

The following fields are offered: history of the Maritimes, with emphasis on the late 18th to mid-20th century; Canadian social history, in particular such areas as poverty and philanthropy, urban and rural social disorder, labour history, and the rise of the city; Canadian political history, particularly the 19th and 20th centuries; Canadian-American relations, particularly since 1867.

**British Imperial and Commonwealth History**

Three separate fields are available: one covering the period to 1783; the second extending from the American Revolution to 1870; and the third from 1870 to the present. With the approval of the graduate Committee, students may offer two of these fields. Students may concentrate their studies on the self-governing colonies or the tropical territories, according to their thesis interest.

**African History**

This field may be studied with special attention to precolonial history during the period of oral tradition, the colonial period since 1800, processes of decolonization in Anglophone Africa, and African labour history in the 19th and 20th centuries.

**British History**

The following fields are offered: aspects of British history 1560-1680; British history before 1867; colonial and imperial policy, including tariff reform, 1868-1914; imperial defense after 1900; and Britain in the two world wars.

**United States History**

Fields are offered in colonial and revolutionary America, 19th century American social, labour, and ethnic history, and 20th century American political and business history.

**European History**

Several types of fields may be offered, depending on the student's previous work and

thesis topic. In some cases the field will need to be concentrated (e.g. Europe 1870-1914); in others a broader field will be advised. Only one field in general European History may be offered.

#### German History

Only one field is available in German history: Germany 1870-1945. Within this, students may concentrate upon particular topics or periods especially relevant to their thesis work. A prior reading knowledge of German is required.

#### Medieval History

Fields are available in English and medieval European history.

#### Russian History

Two fields are available; one in nineteenth-century Russian history and one in twentieth-century Russian and Soviet history.

#### History of Political and Social Theory

Fields may be offered in the broad history of political and social theory (including historiography) or in more specific areas: Renaissance and Reformation political theory, the Enlightenment, and Marxism (including special reference to the Third World).

#### Caribbean and Latin American History

Fields may be offered in aspects of labour (including slave labour history), the impact of imperialism in the 19th and 20th centuries, and transitions to socialism.

#### Women's History

Fields are offered, both as single units and in combination, on women in developed industrial societies (North America), in developing societies (Africa), and in socialist societies (including Cuba and China).

## Human Communication Disorders

Location: 5599 Fenwick Street  
Halifax, N.S. B3H 1R2  
Telephone: (902) 494-7052  
Fax: (902) 494-5151

#### Director of the School

W.B. Green

#### Professors

W.B. Green, BS, MA, PhD (Syracuse)  
G.T. Mencher, BA, MA, PhD (U. Mich.), FASHA  
(Part-time)

#### Associate Professors

C. Sloan, BS, MA, PhD (U. Minn.)  
J. Bedrosian, BA, MA, PhD (U. Wisc.)  
P. Doyle, BA, MA, PhD (U. Cal.)  
E. Skarakis-Doyle, BS, MA, PhD (U. Cal.)  
G.M. Nowotny, MD, FRCS(C), FACS (honourary)

#### Assistant Professors

J. Armon, BSc, MS (Wis.)  
R. Cassie, BPa, MSc, PhD (McGill)  
M. Roland Mieczkowski, BSc, MSc, PhD (Dal)Sr.  
D. Uryase, BA, MA, PhD (U. Conn.)  
E. Yang, MD, MCD, PhD, (U. Texas)  
G.F. Martin, MD (honourary)

#### Research Assistant

A. Stuart, BEd, BSc, MSc

#### Lecturers

M.N. Wall, MD  
G. Whitehead, MA

#### Clinical Coordinators

C. Tompkins, MSc  
L. Carey, MA

#### Clinical Instructors

**Audiology**  
B. Arvar  
M. Gulliver  
S. Maxwell  
C. Santilli  
A. Stuart  
S. Stuttard  
C. Tompkins  
G. Whitehead

#### Speech-Language Pathology

S. Anthony  
L. Carey  
S.A. Delva  
C. Dobblessteyn  
A. Grantmyre

S. Jozza  
A. MacDonald  
L. MacDonald  
H. MacDonald  
J. Martin  
M. Merchant  
V. Roda  
J. Schmidbauer  
B. Shaw  
C. Smith  
K. Smith  
J. Smith-Lamothe  
B. Stoez

## Practicum Supervisors

### Audiology

S. Fortier  
T. Jaing  
D. Lyon  
D. Moffat  
M. Weckman

### Speech-Language Pathology

C. Andrews  
Lynda Campbell  
M. Casey  
S. Flaher  
L. Healey  
A. Keeler  
K. Kennedy  
A. Mason-Browne  
E. Pass  
J. Robertson  
C. Scholten  
D. Wilkinson  
J. Williams  
S. Wozniak

The School of Human Communication Disorders provides a three year programme of studies and clinical experiences leading to a MSc degree in either Speech Pathology or Audiology. The School invites applications from students possessing a baccalaureate degree in Psychology, Educational Psychology, Linguistics, Special Education, Natural Science, Nursing, Health Sciences and other behavioural or health related disciplines. Applications must indicate the student's preference for either Audiology or Speech Pathology.

## Admission Requirements

All applicants must possess a minimum of a baccalaureate degree from a recognized institution of higher education. This programme is designed for students with either minimal or no previous academic experience in the area of speech pathology or audiology. Students whose undergraduate degree is in either speech pathology or audiology may be considered for entrance into the programme at a more advanced level under exceptional circumstances only.

Preference will be shown to students whose

academic background includes at least one course in each of the following five categories:

1. Research Methods, eg. Statistics, Research Design.
2. Physical and Biological Sciences, eg. Anatomy, Physiology, Physiological Psychology, Human Biology, Neurophysiology, Physics, Acoustics.
3. Linguistics, eg. Language Development, Phonetics, Psycholinguistics, Neurolinguistics, Sociolinguistics.
4. Psychology, eg. Developmental Psychology, Abnormal Psychology, Learning Theory, Motivation.
5. Perception and Psychophysics, eg. Sensation, Perception, Speech Perception, Psychoacoustics.

Undergraduate grade requirements should exceed the equivalent of a "B" in the student's major and be at least the "B" level overall. Two letters of recommendation, from Professors in the student's undergraduate major, will be required as well as a statement from the applicant indicating personal reasons for pursuing graduate work in Speech-Language Pathology or Audiology.

## MSc Degree Programme

This degree programme is a full time three year course with summer practicum experiences at the end of the first and second years of study. Currently the School does not offer any part time studies.

Students will be required to attain a minimum of 13 credits (10 academic, 1 final project and 2 clinical practicums) over a three year period. It should be noted that the individual special needs of students, especially with regard to practicum experiences, final project requirements, and possible inadequate baccalaureate course work, might dictate credit requirements in excess of thirteen.

Extensive supervised clinical practice is required throughout the three year programme. Much of this requirement is met by attending a practicum held during the summer months.

A final project is required of all students in order to graduate from the programme. In consort with a Faculty advisor, the student designs, executes, and reports a research project. Depending upon the nature and extent of the project, students may be required to also take additional course work. Successful completion of this requirement results in the equivalent of 1 academic credit.

## Core Curriculum

While students may pursue a course of study that leads to specialization in either Speech-Language Pathology or Audiology, during the programme they will be required to take classes that contain information that is basic to both professions. These classes will be described under "core curriculum" in the class listings that follow.

## Classes Offered

### Core Curriculum

HC 5020B Phonetics

HC 5060R Practicum

HC 5110A Anatomy and Physiology of the Speech Mechanism

HC 5120B Hearing Measurement

HC 5130A Introduction to Speech-Language Pathology

HC 5140A Aural (Re)habilitation with Children

HC 5150B Speech and Language Acquisition

HC 5230A Human Communication Processes

HC 5260B Hearing Disorders

HC 6060A Topics in Clinical Procedures

HC 6310A Audition I

HC 6600A Seminars in Communication Disorders

HC 6980B Research Design

HC 7000R Research Project

HC 7060R Practicum

### Speech Pathology Curriculum (above and beyond core)

HC 5210A Speech-Language Analysis

HC 5250A Speech Disorders - Children

HC 5270A Language Disorders - Children

HC 6350B Language Disorders - Adults

HC 6370B Fluency Disorders

HC 6390B Voice/Resonance Disorders

HC 6450B Speech Disorders - Adults

HC 6470A Speech Perception and Auditory Processing

### Audiology Curriculum (above and beyond core)

HC 5220A Diagnostic Audiology

HC 5240A Aural (Re)habilitation - Adults

HC 5280B Audition II

HC 6320B Pediatric Audiology

HC 6360B Amplification

HC 6380B Electrophysiological Audiometric Measures

HC 6420A Advanced Diagnostic Audiology

HC 6440A Noise in Industry and the Community

### Additional Classes Available

HC 6500 Tutorial Readings

HC 6760 Research

## Interdisciplinary Studies

### PhD Programme

Occasionally a student may wish to engage in a programme of doctoral studies whose requirements are shared by two or more departments within the University. As significant advances in scholarly knowledge frequently occur at interdisciplinary boundaries, the University offers students the opportunity to undertake an interdisciplinary PhD programme. Students considering such a programme must pay particular attention to the following aspects of interdisciplinary doctoral study:

- (a) The responsibility largely lies with the student to 'organize' a unique programme of studies with appropriate faculty members and the Office of the Dean of Graduate Studies.
- (b) The student must hold a first-class Honours undergraduate degree and a Master's degree, or acceptable equivalents, and therefore must have attained an academic level higher than that normally required for entry into a Dalhousie PhD programme.
- (c) The broader demands of interdisciplinary scholarship dictate that a student can expect, typically, to take a year longer to complete an interdisciplinary programme than is normal for a programme in a single discipline. The same residency requirements apply to the Interdisciplinary PhD as all other PhD programmes.
- (d) The student should plan such studies in the context of an overall career goal to ensure that, as far as possible, the programme will constitute a proper qualification for desired employment upon graduation.

Anyone wishing to pursue the programme should plan it within the framework of the following requirements:

- (1) Normally, the student will have completed at least one year of study in a Faculty of Graduate Studies and be in 'good standing'.

- (2) The student should develop a tentative programme of proposed study, reviewing its various features and ramifications, and making sure that it (a) clearly focuses on career goals, (b) is truly interdisciplinary, and (c) cannot be completed within the framework of an extant programme.
- (3) The student should discuss the proposed programme with a faculty member in a participating department obtaining that person's agreement to act as the supervisor or as one of the thesis committee members.
- (4) A formal application should then be initiated for entry into the programme. Details of the procedure (including an application form) for pursuing an interdisciplinary PhD programme are available from the Office of the Dean of Graduate Studies. If the application is approved, a supervisory committee will be established by the Dean.
- (5) The committee will be responsible for supervising the student's overall programme of study, including the setting and scheduling of comprehensive examinations, the development of a thesis proposal, the research, and the thesis-writing and defence.

## Law

Location: Weldon Law Building  
6061 University Avenue  
Halifax, N.S. B3H 4H9  
Telephone: (902) 494-3495  
FAX: (902) 494-1316

### Dean of Law

LM. Christie, BA, LLB (Dal), LLB (Cantab.),  
LLM (Yale), Richard Chapman Weldon Professor  
of Law

### Associate Dean

S.M. Ashley, BA, LLB (Dal)

### Professors Emeritus

C. Hutchins, QC, BA, LLB (Dal)  
A.J. Meagher, QC, BA, LLB (Dal)  
R.G. Murray, QC, BA, LLB (Dal), LLM  
(Harvard)  
J. Willis, QC, BA (Oxon), LLD (Ott., Queen's,  
Dal, York)

### Professors

B.P. Archibald, BA (King's) MA, LLB (Dal),  
LLM (Col.)  
A. Bissett-Johnson, LLB (Nottingham), LLM  
(Mich.) C.L.M. Boyle, LLB (Queen's, Belfast),  
LLM (Queen's, Kingston)  
W.H. Charica, QC, BA (Sir Geo. Wms.), LLB  
(Dal), LLM (Harvard), LLM (Mich.)  
T.A. Cromwell, BMus, LLB (Queen's), BCL  
(Oxon)  
P.E. Darby, BA (Mt. Allison), LLB (Dal)  
E. Gold, BA, LLB (Dal), PhD (Wales), MCTT,  
FNI, MRIN, Master Mariner (FG), Executive  
Director ITOPS  
E.C. Harris, QC, BComm, LLB (Dal), LLM  
(Harvard), RIA, CA  
H.M. Kindred, LLB (Bristol), LLM (London),  
LLM (Illinois)  
R.St.J. Macdonald, QC, BA (StFX), LLB (Dal),  
LLM (London), LLM (Harvard), LLD (McGill)  
A.W. MacKay, BA (MtA), MA (Flor.), BEd  
(MtA), LLB (Dal)  
H.L. O'Brien, QC, BComm, LLB (Dal), LLM  
(Chicago)  
P. Thomas, LLB (Wales), LLM (Yale)  
L.E. Trakman, BComm, LLB (Cape Town), LLM,  
SJD (Harvard)  
C.L. Wiktor, LLM (U of Wroclaw), MS in LS  
(Col.) Law Librarian  
B.H. Wildsmith, BSc (Guelph), LLB (Dal), LLM  
(Harvard)  
J.A. Yogi, QC, BA (St. Mary's), LLB, LLM  
(Dal), LLM (Mich.)

### Associate Professors

V. Black, BA, MA (Carleton), LLB (Tor.), LLM  
(Calif., Berkeley)

J.K. Bankier, BA (Tor.), LLB (Osgoode)  
 L.M.B. Clark, BA (UBC), BPhil (Oxon), LLB (York)  
 W.B. Cotter, BCom (Sask.), LLB, LL.M. (Dal),  
 Executive Director Dalhousie Legal Aid Service  
 R.L. Evans, BA (Tor.), LLB (York)  
 P.V. Girard, BA (Brock), LLB (McGill), LL.M.  
 (Calif., Berkeley)  
 H.A. Kaiser, BA, LLB (Dal), LL.M. (London)  
 W. MacLachlan, BBA (UPEI), LLB (UNB),  
 LL.M. (Yale)  
 D.A. (Rollie) Thompson, BA (McG), LLB (Dal)  
 F.L. Woodman, BA (Dal), LLB (Queen's)

#### Assistant Professors

L. Duncan, BA, LLB (Alta)  
 M.L. McConnell, BA (Vict.), LLB (Dal)  
 D.L. Pothier, BA (Dal), MA (Carleton), LLB (Dal)  
 D.A. Russell, BA (St. Thomas), MA, LLB (Dal),  
 LL.M. (Cambridge)  
 M.E.E. Turpel, BA (Carleton), LLB (Osgoode),  
 Dip. Int'l Law (Camb.)  
 D.L. VanderZwaag, BA, (Calvin), MDiv  
 (Princeton), JD (Arkansas), LL.M. (Dal)

#### Part-Time Faculty

R.P.H. Balcome, BA (St. Mary's), LLB (Dal),  
 LL.M. (London)  
 R.L. Barnes, BA (Acadia), LLB (Dal)  
 B.I. Beach, BA, (Tor.), LLB (Dal)  
 S.D. Bryson, BA, LLB (Dal)  
 V.T. Calderhead, BA (Ulster), MA (Concordia),  
 MA (Queen's) LLB (Dal)  
 J. Campbell, BA (Acadia), LLB (Dal)  
 D.A. Copp, LLB (Dal) BSc (UNB), MEng (TUNS)  
 His Hon. Judge T.T. Daley, BA (Ottawa), BEd,  
 MSW (StFX), LLB (Dal)  
 P.E. Darling, LLB (Dal)  
 M.E. Dumphy, BBA (Notre Dame), MBS (UWO),  
 LLB (Dal)  
 D.P.S. Farrar, BA (St. Thomas), LLB (Dal)  
 J.W. Fitt, BA, LLB, MPA (Dal)  
 J.A. Gumpert, BCom, LLB (Dal)  
 K.D. Harris, BComm, LLB (Dal)  
 M.J. Iosipescu, BA (Sir Geo. Wma.), BSc, MS,  
 LLB (Dal)  
 His Hon. Judge R.E. Kimball, BA (Kings), LLB,  
 LL.M. (Dal)  
 K.D. Latimer, BA (Mt.A), MA (Carleton), LLB  
 (Dal)  
 His Honour Judge E.J. Macdonald, BA (King's),  
 LLB (Dal)  
 K. MacInnis, BA (St. Dunstan's), LLB (Dal),  
 LL.M. (London)  
 C.W. MacIntosh, BA, LLB (Dal)  
 P.C. Martin, LLB (Dal)  
 J.P. Merrick, BA, (Acadia), LLB (Dal)  
 S.C. Norton, LLB (Dal)  
 R.C. Penfound, BPE, LLB (Dal)  
 F. Van Penick, AB (Princeton), LLB (Dal)  
 D.I. Pink, BA (Acadia), LLB (Dal), LL.M.  
 (London)  
 J.E. Pink, BA (Acadia), LLB (Dal)  
 A.C. Reid, BA (St. Mary's), LLB (Dal)

J.M. Rogers, BA (Acadia), LLB (Dal)  
 S.W. Rowley, BA (Smith), MA (Yale), BEd; LLB  
 (Dal), LL.M. (UCLA)  
 F.A. Rozovsky, AB (Providence), JD (Boston),  
 MPH (Harv.), Adjunct Associate Professor  
 L.E. Rozovsky, QC, BA (UNB), LLB (Tor.),  
 Adjunct Associate Professor  
 W.L. Ryan, BCom (St. Mary's), LLB (Dal)  
 D.K. Smith, BA, LLB (Dal)  
 W. Spicer, BA (Carleton), LLB (Dal)  
 G.D. Walker, QC, BA (St. Mary's), LLB (Dal),  
 MCL (Southern Methodist)  
 His Honour Judge R.J. Williams, BSc (Alberta),  
 MSW (Mar. Sch. Soc. Work), LLB (Dal)  
 M.J. Wood, BSc (Acadia), LLB (Dal)

#### Special Lecturers

The Hon. Mr. Justice A.G. Cooper, QC, BComm  
 (Dal), BCL (Oxon)  
 W.J. MacInnes, QC, LLB (Dal)  
 The Hon. I.M. MacKeigan, QC, MA, LLB (Dal),  
 MA (Tor.)

#### Master of Laws (LLM)

A graduate programme in law leading to the Master of Laws degree is offered to well-qualified candidates by the Faculty of Law of the University. The programme is primarily intended for prospective law teachers and professional specialists. The programme may consist of either a combination of course work, seminars and a thesis, or a combination of course work and seminars involving substantial written papers, in either case taken on a full-time basis over one full academic year, or on a part-time basis over two full academic years. Applicants who plan to take the degree on the basis of course work, seminars and a thesis are required to submit outlines of their proposed thesis topic at the time of the application. Thesis topics may concentrate on any area of law in which faculty supervisors and library resources will support substantial and useful work. In recent years, thesis supervision has been provided in the following fields, among others: international law, administrative law, labour law, commercial law, tax law, tort law, criminal law and criminology, domestic relations law, law of the sea, maritime law, and environmental law. A special interest has been developed in marine and environmental law which has been designated as a field of special emphasis in the Faculty of Law. The Sir James Dunn Law Library collection for the Marine and Environmental Law Programme is now one of the best in North America.

#### Admission Requirements

Applicants for admission to the LLM programme should hold a first degree in law equivalent to the Dalhousie LLB, passed with at least a "B" average (or Upper Second Class Honours). The ability to conduct independent

research and to work easily in the English language is a prerequisite for admission. Some candidates may be required to pass the TOEFL (Test of English as a Foreign Language) to the satisfaction of the Graduate Studies Committee of the Faculty of Law prior to admission.

In addition to the Dalhousie Scholarships mentioned on page 43, candidates may be eligible for a special scholarship offered annually by the Nova Scotia Law Foundation to one LL.M. candidate.

### Residency Requirements

The degree may be taken on the basis of either one academic year (September 1 to August 31) of full-time residence at Dalhousie, or two academic years of part-time residence at Dalhousie, after registration for the LL.M. degree. (It should be noted that the two year residence requirement for part-time candidates differs from that required elsewhere in the calendar of the Faculty of Graduate Studies.)

### Course Requirements

The degree may be taken on the basis of either course work, seminars and a thesis, or course work and seminars only. Applicants are required to indicate at the time of formal application on which basis they would prefer to take the degree, but the Graduate Studies Committee of the Faculty of Law, at the time an offer of a place is made, will decide on which of the two alternative bases a place is offered. The availability of places for the thesis alternative is governed by the availability of adequate faculty supervision and library resources. All class work for the degree, whichever of the two alternative bases is decided upon, must be completed at an average of not less than B, with no grade below B-.

All candidates for the degree are required to take a special graduate seminar especially designed for our graduate students in law. This seminar, which is led by at least two senior teachers in the Faculty of Law, is normally given in the fall term and requires from the student a comprehensive class presentation based on a substantial written paper. Some students who have not had previous exposure to Jurisprudence may be advised to take a graduate jurisprudence course.

If the degree is taken by course work, seminars and thesis, a candidate is required to (a) in addition to the graduate seminar, complete at least two additional one-term classes from the course and seminar offerings of the Faculty of Law, the choice of courses to be determined by the Law School's Graduate Studies Committee, and (b) present a well-researched substantial thesis of scholarly quality produced under the continuous supervision of a member or members of the law faculty.

Such a thesis would normally be 150-300 typescript pages in length (double-spaced). Five

copies of the thesis, temporarily bound, must be submitted to the supervisor on or before the dates given in the almanac. The thesis requirements and regulations of the Faculty of Graduate Studies must be met. A thesis may be graded as either "Approved," or "Not Approved." In order to be "Approved," a thesis must normally be approved by the thesis supervisor and two co-readers.

If the degree is taken by course work and seminars without thesis, in addition to the graduate seminar, candidates are required to take at least an additional five one-term courses from the advanced course work and seminar offerings of the Law Faculty considered to be suitable as graduate courses and seminars by the Law Graduate Studies Committee. Of those five courses, at least three must be designated as "major paper courses" by the Faculty of Law, or be approved by the Graduate Studies Committee as having a substantial written component. A "major paper" or "substantial written component" would normally be independently supervised by a faculty member, and would usually consist of a well-researched work of 15,000 - 20,000 words in length, based on a seminar/class presentation.

At the discretion of the Graduate Studies Committee of the Faculty of Law, a candidate may be required to submit to an oral examination by the Committee or its nominees in the field of the thesis or that of any written paper presented by the candidate. The Graduate Studies Committee of the Faculty of Law may recommend the substitution of not more than two seminars or graduate level classes in a discipline other than law, which may be highly relevant to the candidate's thesis topic or area of specialization, provided that any such substituted course or seminar has, in the opinion of the Committee and the Dean of Graduate Studies, equivalence to the law classes being substituted.

Before deciding on the course work and seminars, or course work, seminars and thesis option, candidates who are contemplating future doctoral studies should note that some doctoral programmes may require the completion of a Master of Laws degree which includes a thesis.

### General

The Graduate Studies Committee of the Faculty of Law may at any time require any candidate for the degree to show cause, in such manner as it may determine, why such candidate should be permitted to continue his or her candidacy.

It should be noted that candidates taking the degree on a part-time basis are not eligible for graduate scholarships.

A student is required to comply with the directions of the supervisor and the decisions of the Graduate Studies Committee of the Faculty of Law, as well as the rules and regulations of the Faculty of Graduate Studies.

A full description of programmes available in



the Law School which may be of relevance to graduate students can be found in the general Law School Calendar and in its course selection materials.

**Combined LLB and MBA Programme**

See under "Business Administration" (page 56).

**Combined LLB/MPA Programme**

See under "Public Administration" (page 128).

**Doctor in the Science of Law Degree (JSD)**

An advanced graduate programme in law leading to the JSD (Juris Scientiae Doctor) degree is offered to a very limited number of highly qualified candidates by the Faculty of Law of the University. Applicants who meet the admission requirements are invited to submit a detailed outline of their proposed thesis and a detailed description of their research plans with their application forms. Such topics will have to be limited to those areas of law for which faculty and library resources will support original and useful work. It is expected that such resources will normally be available in four subject areas:

- (i) Marine Law
- (ii) Environmental Law

These areas of the curriculum have been designated as a priority development by the Faculty of Law since 1974. As a result, considerable faculty expertise, library holdings, research projects and course offerings in these areas has been created. Consequently, the Faculty's Marine and Environmental Law Programme has achieved international prominence.

- (iii) International Law
- (iv) Comparative Law

These areas of specialization have grown with seminars in comparative criminal law and comparative marine law and policy. In addition, the Faculty also offers a course in Comparative Civil Law, and participates as the common law component of a joint summer programme in Canadian comparative law sponsored by the Federal Department of Justice.

**Admission Requirements**

Applicants for admission to the JSD programme must have demonstrated superior academic ability during their previous legal education. Normally it will be necessary to have (i) attained at least the equivalent of a Dalhousie A- average grade at the LLB level and (ii) completed successfully a Master's degree in law. Preference will be given to applicants with

established credentials in published scholarship of a professional calibre. The ability to conduct independent research and work easily in the English language is a prerequisite for admission. Foreign candidates are required to pass the TOEFL (Test of English as a Foreign Language) to the satisfaction of the Graduate Studies Committee of the Faculty of Law prior to admission.

Applicants seeking JSD funding from Dalhousie University should ensure that their completed applications are received by the University no later than January 1 of the year in which they intend to commence their studies.

**Residency Requirements**

Applicants must be prepared to spend at least one full academic year (12 months) in continuous residence at Dalhousie after registration for the JSD programme. The Graduate Studies Committee of the Faculty of Law reserves the right in certain cases to require the completion of a second year of residency.

**Course Requirements**

Candidates for the JSD degree may be required by the Graduate Studies Committee of the Faculty of Law, on the recommendation of their thesis committee, to carry out advanced course work in the area of their thesis, or in a cognate area of a more general field of law, or in a discipline other than law, which is deemed to be highly relevant to their thesis topic. When undertaking such course work, JSD candidates must obtain an average standing of at least B+ in all classes designated as "required by the thesis committee", with no grade falling below B. A student who fails to meet these requirements is automatically dropped from the programme, but may apply for readmission immediately.

**Preliminary Examination Requirements**

Each candidate will also be required to pass a preliminary examination not less than 1 year before submitting the thesis. The preliminary examination may be oral, written, or both, at the discretion of the thesis committee, and will cover the subjects relevant to the general area of the candidate's research. Failure to pass this examination may result in dismissal. However, the student may be permitted to repeat the examination within the subsequent 12 (twelve) months.

**Special Skill Examination Requirements**

A candidate may, at the discretion of the thesis committee, be required to pass a special examination designed to demonstrate the examinee's proficiency in a foreign language, statistical method, computer analysis, or other skill deemed to be important for successful completion of the candidate's thesis in the chosen area.

### Thesis Requirements

The primary requirement for the JSD degree is the completion of a substantial thesis which should not only display original scholarship of high standard, but also represent a significant and professional contribution to the literature of the chosen subject. In applying for admission, an applicant is required to satisfy the Graduate Studies Committee of the Faculty of Law that the suggested topic is suitable for development as a doctoral thesis. Normally, a JSD thesis should be between 350 and 500 typescript pages in length (double-spaced). After an applicant has been accepted, a thesis committee consisting of a supervisor and two advisors will be appointed by the Graduate Studies Committee of the Faculty of Law. All candidates are required to comply with the decisions of their thesis committees. In normal circumstances, the completed JSD thesis must be submitted to the Graduate Studies Committee of the Faculty of Law within five years of the date of original registration in the programme. Submission of the thesis must follow the rules and regulations laid down by the Faculty of Graduate Studies.

### Thesis Defence Requirements

Each JSD candidate is required to defend the completed thesis in an oral examination. This defence shall be conducted in accordance with the Faculty of Graduate Studies Regulations for Oral Examination of a Doctoral Candidate.

### Teaching Activities

The Graduate Studies Committee of the Faculty of Law may give permission to a JSD candidate to engage in teaching activities during the period of residency, if such activities are deemed to fall within the field of the candidate's thesis topic. Under no circumstances shall any JSD candidate be permitted to spend more than six hours per week in teaching activities and related preparations.

## Library and Information Studies

**Location:** Killam Library  
6225 University Avenue  
Halifax, N.S. B3H 4H8  
**Telephone:** (902) 494-3656  
**ENVOY:** DAL.LIS  
**FAX:** (902) 494-2319

### Director of School

M. Dykstra

### Professor Emeritus

J.R.T. Etlinger, MA (Oxon.), BLS (McG)

### Professors

L.J. Amey, BSc, BEd (Acad.), MEd (UNB), MS (Col.), PhD (Tor.)

M. Dykstra, BA (Calvin), MLS (Dal), PhD (Sheffield)

### Associate Professors

E. Frick, BA (Tor.), MSLS (Syracuse)

B. Raymond, MA, MLS (Berkeley), MA (Man.), PhD (Chic.)

### Assistant Professors

B. MacDonald, BSc (Acadia), MA, MLS, PhD (UWO)

E. Toma, BA, BEd (Mem), MLS (Dal)

### Adjunct Professors

J. Beaumont, ALA (Brighton), BSc (Carleton)

L.G. Vagianos, BA (Hiram), MA (Suffolk), MSLS (Western Reserve), LLD (P.E.I.)

### Lecturers

C. Armour, BSc (MtA), MSc (Dal), PhD (Lond.)

J. Mahoney-Phummer, MLS (Dal), BA, BEd (Mt. St. Vincent)

### Associated Instructional Staff

R. MacG. Dawson, MA (Tor.), BLitt (Oxon.),

Associate Professor, English Department

J. Dunn, B Math (Waterloo), MLS (Dal)

### Graduate Coordinator

J. Dunn, B.Math (Waterloo), MLS (Dal)

### Administrative Assistant

S. Balogh

Students seeking further information or help in planning courses of study in the School of Library and Information Studies should address themselves to:

S. Balogh  
Administrative Assistant, School of Library  
and Information Studies  
Room 3621, Killam Library  
Dalhousie University, Halifax, N.S. B3H 4H8

The goal of the School of Library and Information Studies is to provide graduate education within the Atlantic Provinces to qualified candidates which equips them for their first and subsequent positions as information professionals. This will be accomplished by exposing students to the theories, technologies and practices which comprise library and information studies. Within the programme, the local professional community is provided with opportunities to acquire new skills and career directions.

The student, therefore, is introduced to the development and significance of librarianship and related information fields, to the underlying principles of the profession, and to the techniques of information organization, analysis, retrieval, and use. Each student is challenged to explore and question through a curriculum which attempts to balance professional studies with supervised practical experience and advanced academic study or individual research.

## Admission Requirements

Candidates must hold a Bachelor's Degree with at least a second class standing from a university recognized by the Senate of Dalhousie University.

All applicants are urged to submit completed documentation early in the year as this is a limited enrollment programme; many more applications are received than there are places to be allotted.

Students are admitted only in September. Students should have had the equivalent of two years of university study in a major language other than English or be prepared to demonstrate a reading knowledge of such a language before graduating from the School's programme. Candidates whose native language is other than English must demonstrate a working as well as reading knowledge of English prior to Admission. A TOEFL score of 550 or the equivalent is the minimum accepted level. The School's booklet, *Information for Prospective Students*, which describes the programme in detail, is distributed to all applicants by the Registrar's Office. Write for a copy if one is not received with the application form.

## MLIS Degree Programme

The degree of Master of Library and Information Studies is awarded upon satisfactory completion of:

1. Sixteen credit half-classes.
2. Two non-credit courses offered during the Fall term: LS 050 - Introductory Module I

and LS 051 - Interim Module II. The first year students take Module I. Second year students do Module II. The correct grade is a P.

3. Work experience of 100 hours in a selected library or other information agency under the supervision of a qualified information professional. This experience is designed to provide the student with exposure to everyday routines and problems as well as the opportunity to test and evaluate class theory, to contribute by actual participation, and to discover and explore areas of particular interest for course specialization and future employment. Students may also elect to meet this requirement by such employment prior to graduation. Further details are available in *Information for Prospective Students*.

In addition to the 10 required classes and 6 electives, students are required to:

1. attend the scheduled lectures series given by visiting experts in library, information and publishing fields;
2. participate in the scheduled trips to relevant institutions within or near the metropolitan area of Halifax/Dartmouth.

## Term Timetables

Certain classes are scheduled in the evening to enable working information professionals to attend. Certain workshops will involve evenings and Saturdays.

The School operates on a 4-term system, which may be varied as follows:

**Two-Year Programme:** Full-time attendance during the Fall and Winter terms of two years.  
**Part-Time Programme:** The degree is to be completed within six years; full-time attendance during two 14 week terms is required by the School during this period, accounting for a minimum of 8 half-classes for credit. One of the two required terms of full-time residence must be the first term of entry into the School.  
**Special Programme Extending Over One Academic Year or One Calendar Year Where Indicated:** Applicants will be considered for a special programme, if they meet the requirement of the Faculty of Graduate Studies by possessing "an honours undergraduate degree in the same field as their graduate programme," i.e. BLS (Honours) or, in the opinion of Faculty, an equivalent qualification.

During each academic year the School of Library and Information Studies schedules a field trip to a city of major importance with regard to library activity. Students are urged to take this field trip. Approximately \$500-\$600 will be required to cover expenses. Consult *Information for Prospective Students*.

## Classes Offered

In the following list the required classes are numbered 550-560. These and classes numbered in the 050 series are required of all students (students have a choice between LS559 and LS560). 600 and 060 classes are electives. All classes with the 'O' prefix are non-credit; 700 classes are experimental or occasional classes. The curriculum has been organized with sufficient flexibility to allow students to pursue an individual research project, or to develop a subject specialty through reading classes for further academic work. There is also a thesis option.

If a student chooses as an elective a class offered by a department other than the School of Library and Information Studies, approval must be obtained from the head of the relevant department and the School.

LS 050 Introductory Module I

LS 051 Interim Module II

LS 550 The Information Environment

LS 551 Organization of Information

LS 552 Research Methods

LS 553 Information Sources & Retrieval

LS 554 Systems Analysis

LS 555 Classification & Subject Access

LS 556 Collections Management

LS 557 Library Management & Organizational Behaviour

LS 558 Database Systems and Management

LS 559 (LS 659) Information Sources in Science, Technology and Business

LS 560 (LS 660) Information Sources in Humanities/Social Sciences

LS 605 Comparative Librarianship

LS 606 Management Information Systems (Cross-listed with School of Business Administration MBA 6903)

LS 615 History of the Printed Book

LS 625 Young Adult Literature and Media Interests

LS 630 Government Documents

LS 635 Classification and Indexing Systems

LS 637 Records Management

LS 645 Children's Literature and Media Interests

LS 650 User Services

LS 655 Bibliography

LS 665-668 Academic Courses

LS 670-671 Reading Courses

LS 675 Health Sciences Literature & Information Sources

LS 680 Archives

LS 681 Bibliographic Instruction

LS 707 Library Management and Current Problems in Librarianship

LS 730 Libraries and the Adult Learner

LS 732 Legal Literature and Librarianship

LS 734 Database Development (cross-listed with MBA 6906)

LS 735 Advanced Online Searching

LS 9000 Thesis: (Four ½ credits)

LS 060 Practical Printing

LS 064 Hand-Binding

ED 5552 Planning and Development of School Library Programmes and Services (Cross-listed with the School of Education)

### School Publications:

*Information for Prospective Students* (annual)

*Newsletter* (annual)

Occasional Papers Series (Write to the Director for a list)

*Y-A Hotline* (Irregular).

Checklist of Canadian Copyright Deposits in the British Museum. Vols. I-V now available.

Monographic series with Scarecrow Press, Metuchen, NJ.

## Marine Affairs

**Location:** Weldon Law Building  
6061 University Avenue  
Halifax, N.S. B3H 4H9  
**Telephone:** (902) 494-3555  
**Fax:** (902) 494-1316  
**Telex:** 019-21863

### Programme Directors

R. Côté, BSc (Loyola), MSc (Memorial), Adjunct Professor, Associate Director, School for Resource and Environmental Studies  
D. VanderZwaag, BA (Calvin), MDiv (Princeton), JD (Arkansas), LL.M. (Dal), Assistant Professor of Law

### Teaching Faculty

D. Day, BA, Dip Ed, PhD Prof. of Geography, Saint Mary's Univ.  
C. Lamson, BA (Skidmore), MS (Simmons), MA (Memorial), MEd (Dal), Assistant Prof. of Environmental Studies, Assoc. Director, Oceans Institute of Canada, Dalhousie Univ.  
L. Mazany, BSFS (Georgetown), PhD (UBC), Assistant Prof., Dept. of Economics, Dalhousie  
M.G. Sathiah, BSc BE Civ. Eng. M. Eng. PhD Assoc. Prof., Dept. of Civ. Eng., Tech. Univ. of Nova Scotia  
A. Bowen, MA (Cantab.), PhD (Calif.) Prof., Dept. of Oceanography, Dalhousie Univ.  
M. Brooks, BOT (McG), MBA (Dal), PhD (Wales) Associate Prof., School of Bus. Admin., Dalhousie Univ.

The Marine Affairs Programme is a one-year, interdisciplinary graduate level course leading to the Diploma in Marine Affairs. The Program examines all aspects of the uses of the sea and is designed to provide students with concepts and tools to work effectively in various aspects of ocean management.

## Admissions

Applicants will apply to Dalhousie University's Faculty of Graduate Studies. Successful applicants will hold a Bachelor's Degree from a university of recognized standing with honours or its equivalent. Selection criteria also include references, relevant work experience and career objectives. Applicants from outside Canada whose native language is not English must also submit a TOEFL (Test of English as a Foreign Language) score or its equivalent. Dalhousie sets a minimum acceptable score of 550. Enrollment is limited to twenty students. The application deadline is January 1.

## Classes Offered

**MARA 5000R Introduction to Marine Affairs**

**MARA 5001R Contemporary Issues in Ocean Management and Development**

**MARA 5002R Independent Research**

**MARA 5003A Marine Science in Marine Technology**

### Electives

Students will select the remaining complement of classes from the broad range offered in the marine field at Dalhousie, Saint Mary's University, and the Technical University of Nova Scotia.

## Mathematics, Statistics and Computing Science

Location: Chase Building  
Halifax, N.S. B3H 3J5  
Telephone: (902) 494-2572

**Chairperson of the Department**  
P.A. Fillmore

### Professors Emeritus

M. Edelstein, MSc (Jerusalem), DSc (Technion-Haifa)  
A. J. Tingley, MA, PhD (Minnesota)

### Professors

J. Borwein, MSc, PhD (Oxford)  
P. Borwein, MSc, PhD (UBC)  
J.C. Clements, MA (UBC), PhD (Tor.)  
M.A.H. Dempster, MSc, PhD (Carnegie Mellon)  
C.A. Field, MSc, PhD (Northwestern)  
P.A. Fillmore, MSc, PhD (Minn.), FRSC  
G. Gabor, MSc, PhD (Eotvos)  
L. Grunenfelder, PhD (ETH Zurich)  
R.P. Gupta, MSc (Agra), PhD (Delhi)  
P. Keast, PhD (St. Andrews)  
K. Moriarty, MSc (Dal), PhD (Imp. Coll.)  
R. Paré, MSc, PhD (McG)  
H. Radjavi, MA, PhD (Minn.)  
P.N. Stewart, MA (Berk.), PhD (UBC)  
W.R.S. Sutherland, MSc, PhD (Brown)  
S. Swaminathan, MA, MSc, PhD (Madras)  
K.K. Tan, PhD (UBC)  
A.C. Thompson, PhD (Newcastle upon Tyne)  
R.J. Wood, MSc (McM), PhD (Dal)

### Associate Professors

A.A. Coley, PhD (Lond.)  
K.A. Dunn, MSc, PhD (Tor.)  
A.A. Farrag, MSc (SFU), PhD (Alberta)  
B.W. Fawcett, MSc, PhD (McM)  
D. Hamilton, MA, PhD (Queen's)  
C.S. Hartzman, MS (Purdue), PhD (Colo.)  
K.P. Johnson, MSc (Tor), PhD (Brandeis)  
J. Mulder, MSc, PhD (UBC)  
R. Nowakowski, MSc, PhD (Calgary)  
C.A. Sastri, MSc (Andhra), PhD (N.Y.)  
M.A. Shepherd, MSc, PhD (Western Ontario)  
K. Thompson, PhD (Liverpool)

### Assistant Professors

K. Bowen, PhD (California)  
K. Dlicher, MSc, PhD (Queen's)  
L. Manchester, MSc, PhD (Toronto)  
I. Punnam, PhD (Berkeley)  
A. Sedgwick, PhD (Tor.)  
B. Smith, MA (Calgary), PhD (Berk.)  
D. Tsang, MAsC (TUNS), PhD (Penn)

### Postdoctoral Fellows

J. Castejon, PhD (London, QMC)  
S. Czapor, MMath, PhD (Waterloo)  
F. Garvan, PhD (Penn State)  
F. Lamache, PhD (McGill)  
M.P. Lamoureux, MS (Stanford), PhD (Berk.)  
S. Lou, PhD (Illinois)  
J. Potvin, MSc (Laval), PhD (Colorado)  
E. Vicari, PhD (Pisa)

### Visiting Professors (1990/91)

D. Noll, (Stuttgart)  
B. Hartnell (SMU)  
D. Qing (Inner Mongolia)  
L. Skula, (Masaryk)

The department offers programmes leading to the degrees of MA, MSc and PhD in the following areas:

**Mathematics (MSc, MA, PhD)** - algebra, approximation theory, differential equations, functional analysis, numerical analysis, operator theory, optimization, relativity theory, stochastic modelling, topology.

**Statistics (MSc, PhD)** - statistical inference, robust statistics, data analysis, multivariate analysis, linear and nonlinear regression, time series analysis, statistical graphics and computing, information theory.

**Computing Science (MSc, MA)** - software development, database systems and design, parallel computing, supercomputers, numerical analysis and optimization, artificial intelligence, computer vision.

## Admission Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies.

Candidates will normally be expected to hold a degree recognized by Dalhousie University as the equivalent of a Bachelor's degree with Honours in one of its own faculties.

GRE Aptitude and Advanced Mathematics scores are recommended for all applicants for graduate studies whose undergraduate work has been completed outside of Canada, and TOEFL scores are required for applicants whose native language is not English. Valid score reports must be received directly from the Educational Testing Service. To ensure consideration for scholarship funds, application should be made early and in any case, before March 31.

## Masters Degree Programme Requirements

1. At least three full-credit classes, not including seminar classes, at the graduate level to be chosen in consultation with a department adviser. In addition, students whose preparation is deficient will be required to complete appropriate classes which will be

designated by the adviser.

2. Attendance and participation in seminars.
3. A satisfactory thesis.
4. Students are required to give an oral presentation of their thesis and at that time to answer questions about the thesis. This presentation will be made after the thesis is in the hands of the student's committee and will be taken into account when the committee makes it's decision.

**Note:** For the degrees of MA, MSc in Computing Science, the courses must be chosen from the list of classes in Computing Science.

**PhD Degree Programme**

For minimum time required to complete this programme see Section 6. Comprehensive examinations are required and must be taken for the first time within 12 months and satisfactorily completed within 16 months of registration in the PhD programme.

Candidates must demonstrate reading competence in at least one foreign language from the following list: French, German, Russian. Attendance and participation in seminars are required. Preparation and defence of a research thesis are required.

**Classes Offered**

A selection of the following graduate classes will be offered subject to demand.

**Mathematics**

**MATH 5010/4010** Introduction to Measure Theory and Integration

**MATH 5020/4020** Analytic Function Theory

**MATH 5030/4030** Advanced Abstract Algebra

**MATH 5035** Topics in Algebra

**MATH 5040** Homological Algebra

**MATH 5050/4050** Intro to Algebraic Geometry

**MATH 5055** Lattice Theory

**MATH 5120** Topics in Ordinary Differential Equations

**MATH 5130/4130** Analysis of Algorithms

**MATH 5135** Categorical Algebra

**MATH 5140/4140** Intro to Functional Analysis

**MATH 5150/4150** Functional Analysis

**MATH 5160/4160** Operator Theory

**MATH 5170** Algebraic Topology

**MATH 5180/4180** Intro to Algebraic Topology

**MATH 5185** Topics in Algebraic Topology

**MATH 5190** Topics in Topology and Functional Analysis

**MATH 5200/4200** Differential Equations - Qualitative Theory

**MATH 5210** Topics in  $C^*$  - Algebras

**MATH 5220/4220** Introduction to Partial Differential Equations

**MATH 5225** Topics in Partial Differential Equations

**MATH 5230/4230** Partial Differential Equations

**MATH 5235** Topics in Operator Theory

**MATH 5240** Topics in Banach Spaces

**MATH 5270/4270** Numerical Software

**MATH 5290** Advanced Topics in Operator Theory

**MATH 5300** Topics in Optimization

**MATH 5301** Topics in Optimization II

**MATH 5310/4310** Nonlinear Programming

**MATH 5315** Convexity and Convex Programming

**MATH 5320/4320** Optimal Control Theory

**MATH 5330** Topics in Graph Theory

**MATH 5360** Advanced Numerical Analysis

**MATH 5380** Approximation of Functions

**MATH 5400** Topics in General Relativity

**MATH 5410** Topics in Cosmology

**MATH 6000-6990** Reading Classes for Advanced Graduate Students

**MATH 7030** Algebra Seminar

**MATH 7150** Topology & Functional Analysis Sem

**MATH 7230** Operator Theory Seminar

**MATH 7670** Optimization Seminar

**Statistics**

**STAT 5060/4060** Advanced Statistical Theory

**STAT 5070 Multivariate Distributions****STAT 5075 Multivariate Analysis****STAT 5090/4090 Probability****STAT 5100/4100 Topics in Advanced Probability and Statistics****STAT 5200/4200 Nonlinear Regression Analysis****STAT 5210/4210 Advanced Topics in Time Series Analysis****STAT 5300/4300 Topics in Statistics and Probability****STAT 5350/4350 Applied Multivariate Analysis****STAT 5390/4390 Time Series Analysis and Forecasting****STAT 5400/4400 Topics in Advanced Statistics****STAT 5620/4620 Data Analysis****STAT 7320 Statistics Seminar****Computing Science****COMP 5101/4100 Operating Systems II****COMP 5131/4130 Analysis of Algorithms II****COMP 5141/4140 Software Design and Devel.****COMP 5151/4150 Theory of Programming Lang.****COMP 5201/4200 Selected Topics in Artificial Intelligence****COMP 5210 Expert Systems****COMP 5251/4250 Information Retrieval****COMP 5271/4270 Numerical Software****COMP 5301/4300 Computational Vision****COMP 5330 Topics in Graph Theory****COMP 5401/4400 Programming Methodology****COMP 5501/4501 Selected Topics in Information Retrieval****COMP 5661/4660 Automata and Computability****COMP 5701/4700 Advanced Topics in Data Base Design****COMP 5801/4800 Computer Systems Modelling****Microbiology**

**Location:** Sir Charles Tupper Building, 7th Floor  
5859 University Avenue  
Halifax, N.S. B3H 4H7

**Telephone:** (902) 494-3587  
**Fax:** (902) 494 5125

**Head of Department****K.B. Easterbrook****Professors**

**K.B. Easterbrook, PhD (ANU), (Structure and Function in Microorganisms; Bacterial Spines)**  
**G.C. Johnston, PhD (York), (Genetic Control of Cell Division)**  
**S.H.S. Lee, PhD (Dal), (Virology; Interferon)**  
**D.E. Mahony, PhD (McG), (Bacteriology; Bacteriocins and plasmids of Clostridia)**  
**K.R. Rozee, PhD (Dal), Dip. Bact. (Tor.), (Viral Pathogenesis; Epidemiology), on leave**  
**D.B. Stoltz, PhD (McM), Biology (Biology of Parasitic Insects; Insect Virology)**  
**C. Stuttard, PhD (Dublin), (Microbial Genetics; Streptomyces)**

**Associate Professors**

**R.I. Carr, MD (Tor.), PhD (Rockefeller), Medicine (Rheumatology)**  
**T. Ghose, PhD (Calc.), Pathology (Immunopathology; Cancer Immunotherapy)**  
**R. Rajaraman, PhD (Dal), Medicine (Extracellular Matrix; Cancer Cell Biology)**

**Assistant Professors**

**R.A. Bortolussi, MD (Tor.), FRCP(C), Pediatrics (Neonatal Infection)**  
**G. Faulkner, PhD (Dal), Ultrastructure**  
**S.A. Halperin, MD (Cornell), FRCP(C), Pediatrics (Diphtheria Vaccine)**  
**P.S. Hoffman, PhD (Virginia Polytechnic), Microbial Pathogenesis. Graduate Studies Coordinator**  
**D.W. Hoskin, PhD (McG.) (Natural Suppressor Cells)**  
**A.C. Issekutz, MD (Dal), FRCP(C), Pediatrics (Inflammation)**  
**T.B. Issekutz, MD (Dal), FRCP(C), Pediatrics (Cell-Mediated Immunity)**  
**T.J. Marrie, MD (Dal), FRCP(C), Medicine (Infection; Pneumonia Disease)**  
**W.F. Schlech, MD (Cornell), FRCP(C), Medicine (Listeria; Nosocomial Diarrhea)**

**Adjunct Professor****C.J. Lucarotti, PhD (McGill), Canadian Forestry Service**



**Disciplines Within Microbiology**

All Microbiology graduate students are expected to have, or acquire, a broad-based understanding of disciplines within Microbiology. Notwithstanding this, the existence of specified "streams" in Immunology and Molecular Genetics in the Department may allow well qualified students, with minimal training in Microbiology but a background in the appropriate subject area, to concentrate their studies while acquiring peripherally the necessary conceptual understanding of Microbiology.

**Admission Requirements**

In conjunction with the general requirements for admission, candidates must have received sound basic instruction in Chemistry and Biology, and four credits with at least second class standing in Microbiology or equivalent.

New students may be required to write a placement examination to assist in the appropriate design of a programme of study.

**MSc Degree Programme**

For minimum time required to complete this programme, see Section 6. Normally, study equivalent to five credits at the graduate level is required. Attendance and participation in seminars is required. A research project must be completed, the result of which will be embodied in a thesis. Part-time study is also allowed. Students must complete course requirements within 4 years and all degree requirements within 6 years of registration. Conditions for admission to this programme are the same as for full-time students.

**PhD Degree Programme**

For minimum time required to complete this programme, see Section 6. Class and seminar requirements are the same as for the MSc programme.

Comprehensive knowledge of microbiology and immunology must be demonstrated and will be assessed by oral examination.

Research of a high calibre is required, the results of which must be embodied in a thesis which makes a significant contribution to knowledge in the chosen field.

**MD/PhD Combined Programme**

For information on the combined MD/PhD programme see "Joint Programmes" (page 47).

**Classes Offered**

**MICR 5001R Microbiology Seminars**

**MICR 5002A/5003B/5005R Advanced Topics in Microbiology:** seminar, G.C. Johnston

**MICR 5004R Pathobiology of Cancer:** lecture 2 hours, T. Ghose

**MICR 5022A/B Microbial Ultrastructure Project:** lab 5 hours, K.B. Easterbrook, D.B. Stoltz

**MICR 5024A Microscopy:** Easterbrook, Stoltz, Willison, Faulkner

**MICR 5026A The Mammalian Cell:** lecture 3 hours, lab 3 hours, R. Rajaraman

**MICR 5027B The Cancer Cell:** lecture 3 hours, R. Rajaraman

**MICR 5037A Genetics of Industrial Bacteria:** lecture/seminar, 3 hours, C. Stuttard. Prerequisite: Microbiology 3033A or equivalent

**MICR 5038B Molecular Biology of Yeast:** lecture/seminar, 4 hours. G.C. Johnston

**MICR 5114B Topics in Basic and Medical Virology:** lecture 2 hours, lab 3 hours. D.B. Stoltz, K.B. Easterbrook, S.H.S. Lee

**MICR 5115B Immunology:** lec 2 hrs. D.W.Hoskin

**MICR 5117C Advanced Topics in Immunology:** seminar 1 hour. D.W. Hoskin

**MICR 5118A Molecular Pathogenesis:** lecture 2 hours, P. Hoffman

**MICR 5301A Cellular Immunology:** lecture 3 hours, R.I. Carr

**MICR 5302B Advanced Immunology:** lecture 3 hours, R.I. Carr, class coordinator.

**MICR 5601A Laboratory Techniques in Molecular Biology:** lab, 6 hours, G.C. Johnston

**MICR 9000 MSc Thesis**

**MICR 9530 PhD Thesis**

## Neuroscience

**Location:** Life Science Building  
Room 3269  
1355 Oxford Street  
Halifax, N.S. B3H 4J1

**Telephone:** (902) 494-5131  
**Fax:** (902) 494-5685

**Contact:** Dr. D. Rasmussen, Department of Physiology and Biophysics or Graduate Coordinator of individual departments.

The University offers a graduate programme leading to the Master of Science and/or Doctor of Philosophy degree. This interdisciplinary programme is coordinated with the departments of Anatomy, Biochemistry, Pharmacology, Physiology and Biophysics, and Psychology with the degree being awarded in Anatomy/Neuroscience, Biochemistry/Neuroscience, etc. Approximately forty faculty members in these five departments are involved in Neuroscience research and can serve as supervisors in this programme. The student must be accepted by both the Departmental Graduate Programme Committee and by the Neuroscience Programme Committee.

The programme is designed to give the student a broad knowledge of the field of Neuroscience in addition to specialized training in one field of research. Normally, the student must take at least two half-classes in neuroscience outside the department in which they are registered, which would replace some of the departmental course requirements. The student's Supervisory Committee will be selected by the Departmental Graduate Programme Committee and the Neuroscience Programme Committee; the Supervisory Committee is primarily responsible for designing and approving the programme that will best meet the student's needs.

### Admission Requirements

In order to be admitted into the Neuroscience programme, a student must have a 4-year honours bachelor's degree with an average of B+ or better. Students with a BSc degree wishing to do a PhD should be registered initially in the MSc programme, but may be considered for transfer into the PhD programme after successful completion of the MSc class requirements. Students with strong undergraduate training in Neuroscience may apply to have some of the course requirements waived.

### Classes Offered

**ANAT 510B Neuroanatomy**

**ANAT 507B Chemical Neuroanatomy**

**BIOC 5301B Biochemical Communication**

**PHAC 5405B Advanced Pharmacology**

**PHAC 5600 series (Neuropharmacology)**

**PHYL 5494B Synaptic Transmission**

**PHYL 5511B Neurophysiology**

**PHYL 5502A/B Cell and Molecular Physiology**

**PSY 6270A/B Comparative Neurobiology**

**PSY 6370A or B Neuroscience Laboratory**

## Nursing

**Location:** Forrest Building, 1st Floor  
5869 University Avenue  
Halifax, N.S. B3H 3J5

**Telephone:** (902) 494-2535

### Director

D.L. Tamlyn, BN(McG), MED(Ott), PhD(Dal), RN

### Professors

B.A. Keddy, BScN (MCSV), MA, PhD (Dal), RN  
J.A. Ritchie, BA (UNB), MN (U. Pitts), PhD (U. Pitts), RN  
P.N. Stern, DNS, MNS, BS (Calif.), RN.

### Associate Professors

F. Gregor, BN (Dal), MN (Dal), RN  
M.J. Horrocks, BSN (UBC), MS, (Psych. N), MS (PHN), D.CMHN (UCSF), AED (Toronto),  
Associate Director/Coordinator, Graduate Programme  
J.M. Hughes, BN (Dal), MS (Boston) RN

### Assistant Professor

G.A. Hart, BN (McG), MSN (UBC), RN

## Admission Requirements

All applicants must be licensed to practice as registered nurses (active practitioner) in a province in Canada or in a foreign country. Applicants must have a Bachelor's degree with a minimum "B" standing. The Graduate Record Examination (Aptitude Test) must be taken and the results forwarded to the Graduate Programme Coordinator before a decision on admissibility can be made. Basic preparation including work experience for the clinical specialization study is required, as are introductory classes in research and statistics. Three letters of reference are also required.

## MN Programme

Dalhousie University School of Nursing offers a two year research oriented programme leading to a Master of Nursing degree, with added preparation in a selected clinical area. The programme consists of 8 credits, made up of core nursing classes (2 ½ credits), clinical classes (2 credits), statistics (½ credit), elective class(es) (1 credit), and the thesis (2 credits).

The MN Programme is accepted by MPHEC as the regional programme for the Maritime Provinces. Non-nursing electives may be taken at other universities (prior approval must be obtained from the School of Nursing). Graduate nursing courses within the Programme are also offered by distance education modes to other Maritime regional centres.

Part-time studies are permitted.

Required classes: N5000A, N5100A/N5120B, N5220B, N5300A/N5320B, and one of N5400R or N5500A/N5520B, N5600A/5620B, N5700R plus N9000. The elective (R or A/B) is chosen in consultation with the academic advisor.

\* The School of Health Services

Administration in co-operation with the School of Nursing, offers a Nursing Service Administration Concentration in the MHSA programme. For details, refer to Health Services Administration.

## Classes Offered

**NURS 5000A (Mc209) Intermediate Statistics:** Math Dept. (½ credit)

**NURS 5100A/N5120B Research Methods:** B. Downe-Wamboldt, B. Keddy (1 credit)

**NURS 5220B Systems & Trends in Health Care Delivery:** M.J. Horrocks (½ credit)

**NURS 5300A/N5320B Theoretical Bases of Nursing I & II:** J. Hughes, M. Stewart (1 credit)

**NURS 5400R Community Health Nursing:** M.J. Horrocks (2 credits), open to independent completion of study

**NURS 5500A/N5520B Nursing of Young Families I & II:** J.A. Ritchie (2 credits), open to independent completion of study

**NURS 5600A/5620B Psychiatric/Mental Health Nursing:** (2 credits). Open to independent completion of study

**NURS 5700R Nursing of Adults:** F. Gregor (2 credits), open to independent completion of study

**NURS 5800R Reading Class:** (1 credit)

**NURS 5810A/N5820B Reading Class:** (1/2 credit)

**NURS 5900R Reading Class:** (1 credit)

**NURS 5910A/N5920B Reading Class:** (1/2 credit)

**NURS 9000 Thesis:** (2 credits)

## Nursing Electives

\*NURS 5960 Social Support: (1/2 credit)

\*NURS 5860 Grounded Theory: (1/2 credit)

\*NURS 5160 Analysis of Research: (1/2 credit)

\*Not offered every year

# Oceanography

**Location:** Life Sciences Building  
1355 Oxford Street  
Halifax, N.S. B3H 4J1  
**Telephone:** (902) 494-3557

**Chairperson of Department**  
E.L. Mills

## Professors

C. Beaumont, BSc (Sussex), PhD (Dal)  
A.J. Bowen, MA (Cantab.), PhD (Scripps)  
C.M. Boyd, MA (Ind.), PhD (Scripps)  
P. Chylek, Diploma (Physics) (Charles, Prague),  
PhD (Calif) Joint appointment in Physics  
R.O. Fournier, MSc (Wm. & Mary), PhD (URI)  
E.L. Mills, BSc (Carl.), MS, PhD (Yale), FLS  
R.M. Moore, BA (Oxon.), PhD (Southampton)  
P.J. Wangersky, ScB (Brown), PhD (Yale)

## Associate Professors

M.R. Lewis, BS, MS (U.Md.), PhD (Dal.)  
K.E. Loudon, BA (Oberlin), MEd (Temple), PhD  
(MIT)  
L.A. Mayer, B.S. (URI), PhD (Scripps)  
B.R. Ruddick, BSc (U. Vic.), PhD (MIT)

## Assistant Professors

B.P. Boudreau, BSc (UNB), MS (Texas A & M),  
PhD (Yale)  
J. Grant, BSc (Duke), PhD (South Carolina)  
O. Hertzman, BSc (UBC), PhD (Wash.)  
W. Hyde, BSc (Tor), MSc (Waterloo), PhD (Tor)  
D. Kelley, BSc (Mt.A.), PhD (Dal)  
G.R. Leans, BSc, MSc, PhD (Tor) Joint  
appointment in Physics  
C. Taggart, BSc (Carleton), PhD (McGill)  
K.R. Thompson, BSc, MSc (U.Manc.), PhD (Liv.)

## Research Associates

N.E. Balch, PhD (Dal), Manager, Dalhousie  
Aquatron  
S. Sathyendranath, BSc (St. Teresa's College), PhD  
(Univ. P & M Curie)

## Honorary Research Associates

R.G. Ackman, BA (Toronto), MSc (Dal), PhD  
(London), TUNS  
J.S. Craigie, BA, MA, PhD (Qu.), Atlantic  
Regional Laboratory, NRC  
F.W. Dobson, BSc, MSc (Dal), PhD (UBC),  
Atlantic Oceanographic Laboratory, Environment  
Canada  
R.W. Doyle, MSc (Dal), PhD (Yale), Dept. of  
Biology, Dal  
J.A. Elliott, BSc (U. of S.), MSc, PhD (UBC),  
Atlantic Oceanographic Laboratory, BIO  
W.G. Harrison, BSc, PhD (North Carolina State),  
BIO

W.D. Jamieson, BSc, MSc (Dal), PhD (Cantab.),  
Atlantic Research Laboratory, NRC  
C.E. Keen, BSc, MSc (Dal), PhD (Cantab.),  
Atlantic Geoscience Centre, Energy, Mines &  
Resources  
M.J. Keen, BA (Oxford), PhD (Cambridge), Geol.  
Survey of Canada, BIO.  
S.R. Kerr, BSc (Carl.), MSc (Qu.), PhD (Dal.),  
BIO, Fisheries & Oceans  
K. Kranck, BSc (McGill), PhD (Uppsala), Atlantic  
Oceanographic Lab, BIO.  
D. Lefavre, BSc (Sherbrooke), MSc, PhD (Laval),  
Maurice Lamontagne Institute, Fisheries &  
Oceans, Mont-Joli  
J.W. Loder, BSc (Acadia), PhD (Dal), Dept. of  
Fisheries & Oceans, BIO.  
J.A. Novitsky, BSc (Penn. St.), PhD (Ore. S.U.),  
Dept. of Biology, Dal  
N.S. Oakley, BSc (McGill), MSc (Saskatchewan),  
PhD (McMaster), BIO  
B.D. Petrie, BSc (StFX), MSc (McG), PhD (Dal),  
Atl. Oceanographic Lab., Environment Canada  
T. Platt, BSc (Nottingham), MSc (Toronto), PhD  
(Dal), BIO  
M. Sinclair, BSc Hon. (Qu.), MSc (Southampton),  
PhD (Scripps Instit.), Fisheries & Oceans  
J.N. Smith, BSc (McGill), MSc (U. of Chicago),  
PhD (Tor.), BIO  
P.C. Smith, BSc MS (Brown), PhD (MIT/Woods  
Hole Oceanography Instit.), Atlantic  
Oceanographic Laboratory, Environment Canada  
R.L. Stephenson, BSc (Trent), PhD (Canterbury),  
Fisheries & Oceans  
G.S. Stockmal, BSc (Manitoba), BSc (Calgary),  
PhD (Brown), Atlantic Geoscience Centre, BIO  
B.J. Topfian, BSc (Durham), MSc, PhD (UCNW,  
Bangor), Physical and Chem Science Branch, BIO  
D.G. Wright, BSc (Laurentian), PhD (UBC),  
Atlantic Oceanographic Laboratory, BIO

## Honorary Adjunct Professors

R.C. Courtney, BSc, MSc (Dal), PhD  
(Cambridge)  
K.T. Frank, BSc, PhD (Toledo), Dept. o  
f Fisheries & Ocean, BIO  
B.T. Hargrave, BSc, MSc (Dal), PhD (UBC),  
BIO, Fisheries & Oceans  
D.A. Huntley, BA (Cantab), PhD (Bristol)  
S. Pearce, BSc (Virginia), MSc, PhD (Dal)  
D.J.W. Piper, BA, MA, PhD (Cantab), Atlantic  
Geoscience Centre, Energy, Mines & Resources

## Admission Requirements

A good Honours degree, or its equivalent, is required for admission to the Oceanography Department.

Undergraduate preparation may be in any of the basic sciences - Biology, Chemistry, Physics or Geology. Degrees in Atmospheric Science, Meteorology, Mathematics or Engineering are also acceptable if the undergraduate work includes a reasonably good background in relevant basic science.

**MSc Degree Programme**

For minimum time required to complete this programme, see Section 6.

Minimum course requirements are a total of 5 half-credit classes at the 5000 level or higher, at least three of which must be chosen from the introductory classes.

Additional classes may be required to strengthen a student's background in basic science. Research and a thesis are required.

**PhD Degree Programme**

For minimum time required to complete this programme, see Section 6. In addition to the four introductory half-classes (5110A-5140B), at least four half-credit classes in advanced classes, ordinarily in the area of the candidate's special interest are normally required. More classes will frequently be desirable.

Candidates must write and defend a proposal for thesis research.

Research and a thesis are required.

**Classes Offered**

Classes marked \* are not offered every year. Please consult timetable upon registration.

OCEA 5110B Introduction to Geological Oceanography: L.A. Mayer, C. Beaumont

OCEA 5120A Introduction to Physical Oceanography: B. Ruddick

OCEA 5130A Introduction to Chemical Oceanography: R.M. Moore

OCEA 5140B Introduction to Biological Oceanography: E.L. Mills

OCEA 5150A Introduction to Biological Oceanography: C. Boyd

OCEA 5160B Fisheries Oceanography: C. Taggart

\*OCEA 5210B Time Series Analysis: K. Thompson

OCEA 5221A Ocean Dynamics: staff

OCEA 5222B Estuary, Coast and Shelf Dynamics: A.J. Bowen

\*OCEA 5223B Ocean Waves: staff

\*OCEA 5230B Biology of Phytoplankton: staff

\*OCEA 5260B Biology of Zooplankton: C.M. Boyd

OCEA 5270R Special Topics in Biological Oceanography: staff

\*OCEA 5280A Chemical Sedimentology & Early Diagenesis: B. Boudreau

\*OCEA 5291A Organic Materials in Seawater: staff

\*OCEA 5292B Chemical Methods: B. Johnson/ R. Moore

\*OCEA 5293A Advanced Marine Particles: staff

\*OCEA 5294A Geochemical Cycles: R. Moore, B. Johnson

\*OCEA 5295A Solution Chemistry for Oceanographers: B. Boudreau

OCEA 5311A Fluid Dynamics I: Staff

OCEA 5312B Fluid Dynamics II: Staff

\*OCEA 5330B Benthic Ecology: J. Grant

\*OCEA 5331B History of Oceanography: E.L. Mills

OCEA 5340B Marine Geology: L.A. Mayer

OCEA 5350B Marine Geophysics: K.E. Louden

\*OCEA 5380B Marine Modelling: staff

OCEA 5411A Dynamic Meteorology I: O. Hertzman, G. Lesina. Cross listed with Physics 5441A

OCEA 5412B Dynamic Meteorology II: O.Hertzman, G. Lesina. Cross listed with Physics 5412B

OCEA 5440A Advanced Topics in Geophysics: Beaumont, Louden, Mayer

\*OCEA 5450A Geodynamics: C. Beaumont

OCEA 5500A Atmospheric Physics I: Staff. Cross listed with Physics 5500A

OCEA 5510B Atmospheric Physics II: Staff. Cross listed with Physics 5510B

OCEA 5520A Introduction to Meteorology: Staff. Cross listed with Physics 5520A

OCEA 5530B Introduction to Radiation and Climate: P. Chylek. Cross listed with Physics 5530B

OCEA 5560A Mesoscale Dynamics: O. Hertzman

OCEA 5570A Light Scattering and Radiative Transfer: P. Chylek

OCEA 5580B Cloud Physics: G. Lesina

**OCEA 5600B Invertebrate Fisheries and Aquaculture:** J. Grant

**OCEA 9000 MSc Thesis**

**OCEA 9530 PhD Thesis**

In addition to the weekly oceanographic departmental seminar, each of the oceanographic subdisciplines has a regular seminar in its specialty. At the seminar, topics of specific interest are discussed and examined.

## Oral and Maxillofacial Surgery

**Location:** 5981 University Avenue  
Halifax, N.S. B3H 3J5  
**Telephone:** (902) 494-1679

**Chair - Oral & Maxillofacial Surgery**  
D.S. Precious

### Professors

C.E. Hope, MBChB (Edin.), FFARCS (Eng.), FRCP(C), Head Department of Anaesthesia  
F.W. Lovely, DDS (Dal), MS (Mich), FRCD(C)  
FICD  
M.M. Cohen Jr., AB (Mich.), DMD (Tufts), MSD, PhD (Minn.), FCCMG  
D.S. Precious, DDS, MSc (Dal), FRCD(C), FADI, Programme Director

### Associate Professor

B.B. Harsanyi, DDS, MS, FRCD(C)

### Assistant Professors

R.A. Barker, MB, ChB, FRCP(C)  
A.K. Bhardwaj, BDS, DDS, FRCD(C)  
A.A. Drysdale, MDCM, FRCP(C)  
R.E. Howell, DDS (Loma Linda), Cert. Oral Path (USC Med. Ctr.)  
J.G.L. Lovas, BSc (Tor), DDS (Tor), MSc (UWO)  
B.A. Wright, BDS (Lon.), LDS, RCS (Eng), DDS (Dal), MS (Indiana), MD (Dal)  
R.H. Yabsley, MD, BSc, (Med), FRCS(C), FACS

The four-year programme in Oral and Maxillofacial Surgery which starts on June 1st each year is designed to provide graduate students with a comprehensive background for the practice and teaching of Oral and Maxillofacial Surgery, and to qualify them for examination by the Royal College of Dentists of Canada.

Particular emphasis is placed upon the basic sciences and clinical hospital surgery practice.

## Admission Requirements

Candidates to be considered must possess both a DDS or DMD and the National Dental Examination Board Certificate to be eligible for Licensure in the Province of Nova Scotia.

Candidates must register for the entire four years of the programme and pay full tuition for the first three years and thesis only registration for the fourth year.

Application must be completed prior to June 30 of the year preceeding commencement of the programme.

## MSc Degree Programme Requirements

1. Satisfactory completion or credit for the prescribed courses.
2. Satisfactory knowledge and skills in all the phases of clinical oral and maxillofacial surgery.
3. Satisfactory completion of a research study and submission of the results in the form of a thesis acceptable to the Director of the programme.

## Curriculum

### Year 1

500 Anatomy	1 credit
501 Surg Anatomy	1 credit
502 Physical Diagn	Audit
503 Clinical Lab Medicine	Audit
504 Pharmacology	Audit
506 Oral Pathology	1 credit
507 Seminar	Audit
508 Clinical Oral Surgery	1 credit
509 Microbiology	1 credit
511 Pathobiology	Audit

### Year 2

600 Anaesthesia	1 credit
601 Medicine	Audit
602 Clinical Physiology	Audit
603 Oral Pathology	1 credit
604 Seminar	Audit
605 Clinical Oral Surgery	1 credit
606 Orthopedics	Audit
607 Infectious Diseases	Audit
608 Emergency Medicine	Audit
609 Neurosurgery	Audit

### Year 3

700 Oral Pathology	1 credit
701 Seminar	1 credit
702 Clinical Oral Surgery	1 credit
703 Research 1	1 credit

### Year 4

800 Clinical Oral Surgery	1 credit
801 Seminar	1 credit

**9000 MSc Thesis**

## Pathology

**Location:** Sir Charles Tupper Bldg., 11th Floor  
5859 University Avenue  
Halifax, N.S. B3H 4H7  
**Telephones:** (902) 494-2091

**Head of Department**  
M.A. MacAulay

### Professors

T. Ghose, MB/BS/PhD (Calc.), FRC Path. (U.K.)  
M.L. Givner, BSc, MSc, PhD (McG)  
D.T. Janigan, BSc, MD (Dal) FRCP(C), FCCP  
M.A. MacAulay, MD (Dal), FRCP(C)  
G. Rowden, BSc (Exeter), MSc, PhD (Lond),  
MRC Path.

### Associate Professors

A.D. Fraser, BA (Houghton), PhD (Boston),  
FACB, DABCC, Graduate Studies Coordinator  
D.L. Guernsey, PhD (Hawaii)  
R.F. McCurdy MPH, MSc (Minn.), PhD, (TUNS)  
M.A. Moss, MB, BS (London), MSc (Dal),  
FRCP(C)  
A.A. Trillo, MD(Nat'l. Univ. Mexico), PhD(UWO)

### Assistant Professors

D.E.C. Cole, BSc/MD(Tor), PhD (McG), FCCMG  
K.C. Dooley, PhD (UBC)  
L.C. Dymond, BSc (Memorial), MSc, MD (Dal),  
FRCP(C)  
W.L. Greer, BSc, PhD (UWO)  
D.C. Riddell, BSc, PhD (Queen's)  
G.T. Roberts, BSc (Durham), MB (Newcastle),  
FRCP(C)  
S.J. Luner, BS (Cal Inst. of Tech.), PhD (UCLA)  
C.G. Waghorne, BSc (Guelph), PhD (Tor.)  
J.R. Wright, Jr., BS, MA, MD (Ohio)  
E.Z.M.A. Zayed, MB, BCh (Egypt) FRCP(C)

Research for the MSc degree may be conducted in experimental pathology and/or allied fields of medical sciences (e.g. clinical chemistry, hematology or histopathology) for those planning a career as a laboratory scientist.

### Admission Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. In addition, candidates with the MD degree may be admitted.

### MSc Degree Programme

This programme is intended to give the student a strong background in the experimental approach in pathology. Although the course may be completed in 12 months, most students require 24 months.

General Pathology 500 and one other credit in a subject related to the thesis research, or the laboratory field chosen are required. In addition, all students are required to enrol in and participate in the seminar programme (Pathology 509). Other classes may be required depending upon the background preparation of the student, the nature of the student's thesis or career goals.

Candidates must participate as appropriate in the weekly series of conference seminars in Pathobiology, Laboratory Medicine, Surgical and Autopsy conferences.

Research and a thesis are required. The thesis must be defended by oral examination which covers the candidate's area of study and research.

### Classes Offered

Classes marked with an asterisk are normally offered in alternate years. Pathology 502 and 504 were taught in the 1990-91 academic year.

**PATH 500 General Pathology:** This is the class given to the first year medical class and is described in the Faculty of Medicine Calendar.

**\*PATH 501 Clinical Medical Biochemistry:**  
Sessions: Two lectures and one problem solving session weekly throughout the academic year. L.C. Dymond and D.E.C. Cole.

**\*PATH 502 Pathobiology:** Sessions: 50 lecture-seminar sessions will be given throughout the year. D.T. Janigan.

**\*PATH 503 Principles of Instrumentation:**  
Sessions: Three one hour lectures including problem session weekly, plus assigned laboratory sessions throughout the academic year. R.F. McCurdy.

**\*PATH 504 Pathobiology of Cancer:** Sessions: Two sessions weekly throughout the academic year. T. Ghose

**\*PATH 505 Special Topics: General**

**PATH 506 Special Topics in Morphometrics and Stereology:** M.A. MacAulay

**PATH 507 Special Topics in Electron Microscopy**

**PATH 508 Special Topics in Immunocytochemistry and Histochemistry**

**PATH 509 Pathology Graduate Students Research Seminar**

### Seminars - Conferences

A series of weekly seminars, journal clubs, and conferences is conducted throughout the year in various areas of pathology, and laboratory medicine.

**Areas of Specialization for MSc Thesis**

Immunopathology of lung, kidney, and skin diseases; Application of immunological markers; Production of monoclonal antibodies; Cancer diagnosis and treatment with antibody-linked radionuclides and cytotoxic agents: T. Ghose

Lung injury mechanisms induced by inhalation of combustion products from plastics and synthetics and occupational lung disease: D.T. Janigan

Human Molecular genetics and tumour suppression: D.C. Riddell.

Molecular genetics in cancer diagnosis: W.L. Greer.

Immunology of type I diabetes mellitus; islet transplantation: J. Wright.

Dermatopathology with respect to the immune system of the skin. Pigment cell biology. Immuno-electronmicroscopic staining methods. Dendritic cells of the mononuclear phagocyte system: G. Rowden

Immunodiagnosis of cancer, antihormonal therapy of hormone-dependent cancers, new endocrine and Cyclosporin A assays: M.L. Givner

Atherosclerosis, cardiovascular pathology, nephropathology: A.A. Trillo

Quantitative chemical and microscopic techniques in evaluating clinical surgical methods of arresting organ function, e.g. open heart surgery. Expert computer systems in Laboratory Medicine: M.A. MacAulay

Computerization and instrumental methods in the clinical chemistry laboratory, use of gas chromatography/mass spectrometry in the investigation of metabolic disease: K.C. Dooley

Forensic toxicology, new analytical procedures for drug analysis, drug metabolism, drug interactions, and toxicity: A.D. Fraser

Hemoglobin structure and synthesis disorders. Leukaemia and lymphoma cell lineage: G.T. Roberts

The malignant cell surface, blood cell membranes and monoclonal antibodies to tumour cell surface antigens: S.J. Luner.

Trace metals, natural radionuclides and environmental health: R.F. McCurdy.

Interference in digoxin assays, hypouricemic states: L.C. Dymond.

Environmental pathology, trace metals and disease,

biochemical aspects of forensic medicine, investigation of porphyrias: M.A. Moss. Coagulation and platelet disorders: E.Z.M.A. Zayed.

Biochemical genetics and inherited metabolic disease; metabolism of inorganic macronutrients - calcium, phosphorus, sulfur: D.E.C. Cole.

Molecular biology of tumour progression and metastasis: C.G. Waghorne.

Molecular mechanisms of oncogenesis and thyroid hormone action: D.L. Guernsey



## Pharmacology

**Location:** Sir Charles Tupper Building, 6th Floor  
5859 University Avenue  
Halifax, N.S. B3H 4H7  
**Telephone:** (902) 494-3435

**Head of Department**  
K.W. Renton

### Professors

J.W. Downie, BSc, PhD (Man.)  
G.R. Ferrier, BSc, PhD (Man) Grad Studies Coord  
J.D. Gray, BSc, MD, (Alta.), FRCP(C), Medicine  
K.W. Renton, BSc (Sir Geo. Wma.), PhD (McG)  
H.A. Robertson, BA, MSc(UWO), PhD (Cantab.)  
M.M. Vohra, BPhm, MPhm, PhD (Ban.)  
T.D. White, BSc, MSc (UWO), PhD (Bristol)

### Associate Professors

G.M. McKenzie, BSc (Windsor), MSc, PhD (Dal)  
J. Sawynok, BSc, MSc (Mefb.), PhD (Queen's)

### Assistant Professor

J. Blay, BSc(Hons), PhD (Cantab)  
C.R. Dean, BSc (MtA), MSc (Dal), DPhil (Oxon.), MD (Dal) Medicine  
R.L. Hall, BScPharm (Dal), MD (Dal), Anesthesia  
O.R. Hung, BSc, MD (Dal), FRCP(C)  
S.E. Howlett, BSc Hons (Concordia), MSc, PhD (Mem)  
M.E.M. Kelly, BSc(Hons), PhD (U. Southampton, England)  
P.T. Pollak, MD, PhD (UWO)

### Admission Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. Students registered in the Faculty of Medicine may, upon completion of the second year of studies, be admitted to a PhD programme.

### MSc Degree Programme

For minimum time required to complete this programme, see Section 6. Candidates must complete satisfactorily the following classes or their equivalents: 5403, 5404, 5405B, and a minimum of two half credit courses in the 5600 series. An ancillary course chosen from courses offered by another department in the Faculty of Graduate Studies may be required. Candidates must also satisfactorily complete short research projects in two departmental laboratories (5501, 5502). Students are expected to attend research seminars within the department. Laboratory teaching experience is included in the programme. Thesis research, and preparation and oral defense of a thesis are required.

### PhD Degree Programme

For minimum time required to complete this programme, see Section 6. A qualifying examination for entrance into the PhD programme may be required. Candidates must complete satisfactorily the course requirements listed for the MSc degree plus two additional half credit courses in the 5600 series. An additional short research project (5503) is optional. An ancillary course chosen from courses offered by another department in the Faculty of Graduate Studies is required. Students are expected to attend research seminars within the department. Lecture and laboratory teaching experience is included in the programme. A comprehensive examination is required. Thesis research, and preparation and oral defense of a thesis are required.

### MD/PhD Combined Programme

For information on the combined MD/PhD programme see "Joint Programmes" (page 47).

### Areas of Research Specialization

Faculty research interests include: cardiac electrophysiology and pharmacology, interferon, polypeptide growth factors and signal transduction, general anaesthetics, neurotransmitter receptor mechanisms, autonomic physiology and pharmacology, behavioral pharmacology, mechanisms of analgesia, drug metabolism, and experimental therapeutics.

### Classes Offered

The 5501-5503 classes are normally for graduate students in Pharmacology, but available to others by special arrangement.

Three or four classes in the 5600 series are offered each term on a two-year rotating cycle as indicated below.

**PHAC 5401 Introduction to Pharmacology**

**PHAC 5402 Systematic Pharmacology**

**PHAC 5403 Systematic Pharmacology: (includes laboratory)**

**PHAC 5404 Experimental Design and Interpretation**

**PHAC 5405B Advanced Pharmacology**

**PHAC 5501A/B Introduction to Research in Pharmacology I**

**PHAC 5502A/B Introduction to Research in Pharmacology II: Same as 5501A/B**

**PHAC 5503A/B Introduction to Research in Pharmacology III: Same as 5501 and 5502. Available only to students in the PhD programme.**

**PHAC 5506 MSc Practice Teaching**

**PHAC 5507 PhD Practice Teaching**

**Offered in 1991/92\***

**PHAC 5602A Mechanisms of cardiac arrhythmias and antiarrhythmic drug action: G. Ferrier**

**PHAC 5603B Neuropharmacology of pain: J. Sawynok**

**PHAC 5610B Anaesthetics: R. Hall**

**PHAC 5612A Clinical trial design: J. Gray**

**PHAC 5613A Pharmacology of antacids: M. Vohra**

**PHAC 5621B Pharmacology of drug abuse (Pharmacy elective): G. McKenzie**

**PHAC 5623C Clinical pharmacology: J. Gray**

**Offered in 1992/93\***

**PHAC 5605A Functions of extracellular purines in the central and peripheral nervous system: T. White**

**PHAC 5607A Ion channels, drug receptors and second messenger systems in the heart: S.E. Howlett**

**PHAC 5611B Drug metabolism: K. Renton**

**PHAC 5616B Molecular neuropharmacology: H. Robertson**

**PHAC 5617B Pharmacology of cell growth: J. Blay**

**PHAC 5619A Topics in autonomic pharmacology: J. Downie**

**PHAC 5621B Pharmacology of drug abuse (Pharmacy elective): G. McKenzie**

**PHAC 5623C Clinical pharmacology: J. Gray**

\* Classes offered are subject to change. Please contact the department.

**PHAC 9000 MSc Thesis**

**PHAC 9530 PhD Thesis**

## Pharmacy

**Location:** Burbidge Building  
5968 College Street  
Halifax, N.S. B3H 3J5  
**Telephone:** (902) 494-2378

**Director of College**  
R.F. Chandler

**Professor Emeritus**  
J.G. Duff, BSP, MSc (Sask.), PhD (Fla.)

**Professors**  
R.F. Chandler, BScPharm, MSc (Alta), PhD (Syd)  
M. Mezel, Dipl Pharm (Bp), PhD (Oregon State)  
I.S. Sketris, BSc (Pharm) (Tor.), PharmD (Minn.)  
D.K. Yung, BA, BSP, MSc (Sask.), PhD (Alta.)

**Associate Professors**  
I. Abraham, BPharm, MPharm (UST Kal), PhD (Neb)  
P.S. Farmer, BSP, MSc (Sask.), PhD (Portsmouth)  
M.E. MacCara, BScPharm (Dal), PharmD (Minn.)  
P.K.F. Yeung, BSc (Pharm), MSc (Man.), PhD (Sask.), Graduate Studies Coordinator

**Assistant Professors**  
E. Butler, BSc (Chem), MSc (Chem), PhD (Colloid Chem, Bp)  
J.L. Glennie, BSc(Pharm) (Tor), PharmD (Wayne State, Detroit)  
A.M. Whelan, BScPharm (Dal), PharmD (MUSC)

**Lecturers**  
M.L. Ackman, BSc(Pharm) (Dal), PhC.  
K. Shipp, BSc(Pharm) (Dal)  
B. Wilson, BSc (Pharm) (Dal.), PhC

**Honourary Professor**  
D.W. Jones, BSc, PhD (Birm.), FICeram, CChem, FRSC (UK), FADM

**Honorary Adjunct Associate Professor**  
M.A. Quilliam, BSc(Hons), PhD (Man)

The College of Pharmacy offers MSc and PhD programmes in the areas of pharmacokinetics, biopharmaceutics, drug disposition and metabolism, medicinal chemistry, pharmacognosy, physical pharmacy and drug analysis. For more detailed information on the administration of these programmes applicants and students are referred to the Handbook for Graduate Studies in the College of Pharmacy which is available from the Graduate Studies Coordinator, College of Pharmacy.

## Admission Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies (see Section 2). Applicants from outside of Canada must submit the results of the Graduate Record Examination (GRE, Aptitude). Canadian applicants also are advised to submit GRE scores, and the College reserves the right to make this a precondition to consideration of the student's application for admission. A score of at least 550 on the TOEFL is required of applicants whose native language is not English (Section 2).

Students entering with a BSc (Pharm) Degree or its equivalent will be registered in the 1-year MSc programme. Students entering with an Honours BSc Degree in a field other than pharmacy (e.g., biology or chemistry) may be required to register in the 2-year MSc programme, although candidates with suitable academic backgrounds will be registered in the 1-year programme. Applicants holding a Pass BSc Degree may exceptionally be eligible for admission to the 2-year MSc programme. In certain circumstances, a student may be admitted to a Qualifying Year programme of preliminary work in order to meet admission standards for the MSc programme.

An MSc in pharmacy is normally required for entry directly into the PhD programme, although students in the MSc programme may apply to transfer to the PhD programme subject to the conditions described in the Handbook for Graduate Students in the College of Pharmacy.

Ultimate approval of a student's transfer to the PhD programme must be made by the Dean of Faculty of Graduate Studies.

## MSc Degree Programme

For minimum times required to complete this programme see Section 6.

Experience has shown that most candidates require an additional 6-12 months to complete the thesis requirement. A Graduate Advisory Committee chaired by the research supervisor and comprised of two other members will be appointed for each student.

Candidates must complete satisfactorily a minimum of two advanced classes, the actual programme of classes required to be determined by each student's Graduate Advisory Committee. Additionally candidates must participate in the weekly graduate seminars (Pharmacy 5000C) during each year in the programme. A major part of the requirements for the MSc Degree is the preparation and oral defence of a thesis (Pharmacy 9000) describing research done by the student. The primary purpose of the MSc Degree programme is to develop in the student research skills in an area of the pharmaceutical sciences at a level which will enable the student to carry out research relatively independently. The dissertation is expected to be of such scope and skilful presentation as to indicate that the candidate has acquired a command of the subject, has the

demonstrated ability to contribute fresh knowledge or a fresh outlook to the subject, and has mastered the research methodology of the discipline.

Candidates are normally required to demonstrate in an undergraduate Pharmacy class for at least one year.

Financial assistance is generally available for no more than two years.

## PhD Degree Programme

For minimum times required to complete this programme see Section 6.

It is expected that most candidates will require an additional 12 months to complete the thesis requirement. A Graduate Advisory Committee chaired by the research supervisor and comprised of two other members will be appointed for each student. Candidates must complete satisfactorily a minimum of two graduate classes in addition to those required for the MSc programme, the actual programme of classes required to be determined by each student's Graduate Advisory Committee. To determine courses a student should enrol in, an oral and/or written examination may be required by the Graduate Advisory Committee prior to registration of a new student coming from outside of the College. Additionally candidates must participate in the weekly graduate seminars (Pharmacy 6000C) during each year in the programme. Reading comprehension of a foreign language and/or proficiency in an ancillary research skill such as computer programming is required. Students are required to pass a preliminary oral examination not less than one year before defending the thesis.

The PhD Degree programme prepares the student to conceptualise, design and execute sound independent research. Thus the completion of an extensive, original investigation and the preparation and oral defence of a thesis (Pharmacy 9530) describing this research constitutes the major part of the requirements for the PhD Degree. The PhD research project is of more substantial dimensions than that for the MSc Degree, and the demonstration of a definite advance of knowledge is expected.

Candidates are required to obtain some teaching experience by demonstrating in an undergraduate Pharmacy laboratory class for at least one year and by presenting in the order of three lectures per year in an undergraduate Pharmacy class.

Financial assistance is generally available for no more than four years post-baccalaureate or three years for a student entering with an MSc Degree.

## Classes Offered

**PHAR 4230A Dermopharmacy:** M. Mezel, lecture 2 hours. Prerequisite: Consent of the instructor

**PHAR 4330B Herbal Remedies:** R.F. Chandler, lecture 3 hours second term

**PHAR 4340C/5340C Drug Design:** P.S. Farmer, lecture 2 hours first term, lab approximately 3 hours second term. Prerequisite: Consent of the instructor

**PHAR 4930B/5930B Introductory Drug Metabolism and Toxicology:** P.K.F. Yeung, lecture 2 hours plus a special project for graduate students. Prerequisites: Pharmacology 3470 or 3480, Biochemistry 3100, Therapeutics 3500

**PHAR 4910/5910A or B Advances in Drug Metabolism and Disposition:** P.K.F. Yeung and M.A. Quilliam, lecture 2 hours. Prerequisite Pharmacy 4930B/5930B. Offered every other year

**PHAR 5000C/6000C Pharmacy Seminar**

**PHAR 5250B/4250B Advanced Pharmacokinetics:** I. Abraham. Every other year; consult Department. Prerequisite: Pharmacy 4100C, Pharmacy 3250A

**PHAR 5290 Topics in Biopharmaceutics:** M. Mezel, lecture 2 hours. Prerequisite: Consent of the instructor

**PHAR 5320A or B Topics in Medicinal Chemistry:** P.S. Farmer, lecture 2 hours. Prerequisite: Pharmacy 3300

**PHAR 5980A (M2090A) Intermediate Statistics:** C.A. Field (Math Dept.)

**PHAR 9000 MSc Thesis**

**PHAR 9530 PhD Thesis**

## Areas of Specialization

- Studies on dose-dependent disposition kinetics of drugs; kinetics of enterohepatic circulation of drugs; drug-drug kinetic interactions. (I. Abraham)
- Phytochemical and pharmacological investigation of the medicinal aspects of maritime flora, and evaluation of the safety and effectiveness of herbal remedies. (R.F. Chandler)
- Design and synthesis of drugs, prodrugs, drug metabolites and rotationally restricted analogs. (P.S. Farmer)
- Design and evaluation of selective drug delivery systems. (M. Mezel)
- Analytical methods development (RIA,

HPLC, GC, etc.) with application to pharmacokinetic, pharmacodynamic, and metabolism studies. Emphasis is on the kinetic aspects (*in-vivo* and *in-vitro*) of drug metabolism and its relationship to pharmacodynamic effects in animal species and in humans. (P.K.F. Yeung)

- Physico-chemical, colloidal and surface characterization of particulate matter. Drug Powders, liposomes, microspheres and microcapsules. Stability of disperse systems. Interfacial phenomena and application to pharmaceutical systems. Design and Evaluation of controlled release drug delivery systems. Study of bioadhesion and bioadhesive materials. (E. Butler)

**Philosophy**

**Location:** 1400 Henry Street  
Halifax, N.S. B3H 3J5  
**Telephone:** (902) 494-3811

**Chairperson of Department**  
S.A.M. Burns

**Professor Emeritus**  
D. Braybrooke, BA(Harv), MA, PhD(Corn) FRSC

**Professors**

S.A.M. Burns, BA(Acad), MA (Alta), PhD (Lond)  
R.M. Campbell, BA (Harv.), PhD (Corn.),  
Graduate Coordinator - Admissions  
W.F. Hare, BA (Lond.), MA (Leic.), PhD (Tor.) -  
Major appointment in Education Dept.  
R.M. Martin, BA (Col.), MA, PhD (Mich.),  
R.P. Puccetti, BA (Ill.), MA (Tor.), Docteur de  
l'Université de Paris (Sorbonne)  
P.K. Schotch, PhD (Wat.)  
S.B. Sherwin, BA (York), PhD (Stanford)

**Associate Professors**

N.C. Brett, BA (New Hamp), MA, PhD (Wat)  
D. MacIntosh, BA (Queens), PhD (Tor.)  
T. Tomkow, BA (SFU), PhD (Cantab.)  
T. Vinci, BA (Tor.), PhD (Pitts.), Graduate  
Coordinator - Programmes

**Adjunct Professors**

M. Fry, BA (King's), MA (Dal), BLitt (Oxon)  
A. Kernohan, SB (MIT), MSc (Tor.), MA (Dal),  
PhD (Tor.)

**Visiting Professors**

W. Barthelmy, BA (Wright), MA (Man), PhD  
(Wat)  
S. Wein, PhD (Wat.)

Candidates are expected to have some acquaintance with several areas of philosophy, including modern logic and the history of philosophy. Each student's programme is arranged individually in consultation with the department in relation to the student's interests and preparation. Enquiries should be addressed to the Graduate Studies Coordinator, in the Department.

**Admission Requirements**

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies.

**MA Degree Programme**

**One Year:** For students with an Honours BA or equivalent in philosophy. Requirements include three classes\* and a thesis.

**Two Year:** For those with a BA in philosophy or an honours degree in a related field.

Requirements include four classes\* in the first year, three in the second, and a thesis.

**Qualifying Year:** Students lacking the background for the above programmes take 5 classes\* and may apply the following year for an MA programme.

**Part-Time MA:** Students may meet the requirements for a full-time programme on a part time basis during a maximum period of six years.

\* Note: A "class" means one full-year or two half-year classes.

**PhD Degree Programme**

For minimum time required to complete this programme, see Section 6. Normally, the doctoral student will be required to attend three graduate seminars beyond the requirements for the MA. Reading knowledge will usually be required in one language other than English in which a significant body of philosophical literature exists. There are three comprehensive examinations to be completed in (1) ethics and political philosophy; (2) metaphysics, epistemology, philosophy of language and science; (3) logic and philosophy of logic. Completion of the programme requires original research on a project of substantial dimensions, culminating in the submission and oral defence of a thesis. This research should be in an area already well-established as a specialty by members of the department, such as, political and social philosophy, ethics, philosophy of mind, epistemology, philosophy of language, or logic.

**Classes Offered**

The Philosophy Department offers four kinds of graduate classes: adjunct, general, seminar, and directed reading. Adjunct classes presuppose no prior preparation in the area covered by the class. Thus, a graduate student with no previous training in modern symbolic logic could take the combination 2130 and 2140 which provides a comprehensive introduction to this subject. These classes, since they are not intended for advanced study in the area designated, are open to graduate students in philosophy only in special cases and by permission of the Department. General classes cover a wide range of topics and presuppose some previous study in the area covered by the class. They are suitable for graduate students who want to deepen their understanding of a general area of study but have not specialized in it as an undergraduate. Seminar classes are relatively narrow in focus and presuppose extensive previous study in the area. Directed Reading classes are developed jointly by a student and an instructor in special cases to suit individual interests and needs. These are subject to departmental approval.

Note that the classes listed are half-year, unless otherwise indicated, and not all are given in any one year. Instructors in seminar classes are likely to vary from year to year. Consult Dept.

**Adjunct Classes**

PHIL 2130 Logic: Deduction: R.M. Martin

PHIL 2140 Logic: Logical Theory I: P.K. Schotch

PHIL 2160 Philosophical Issues of Feminism: S. Sherwin

PHIL 2260 Philosophy and Art: S.A.M. Burns

PHIL 2350 History of Philosophy: Ancient Philosophy I: T. Vinci and S.A.M. Burns

PHIL 2370 History of Philosophy: Ancient Philosophy II: S.A.M. Burns

PHIL 2410 Philosophy of Psychology: T. Tomkow

PHIL 2420 Philosophy of Biology: R. Campbell

PHIL 2510 Philosophy of Social Science: D. Braybrooke

PHIL 2550 Marxist Theory: D. Braybrooke

PHIL 2610 History of Philosophy: The Rationalists: D. MacIntosh

PHIL 2620 History of Philosophy: The Empiricists: S.A.M. Burns

PHIL 2700 Philosophy in Literature (full-year): R. Martin

PHIL 2705 Philosophy in Literature (half year): R. Martin

PHIL 2820 Philosophy and Educational Administration: W. Hare

**General Classes**

PHIL 5051 Theory of Knowledge: T. Vinci

PHIL 5060 Logic: Logical Theory II: P.K. Schotch

PHIL 5100 Ethics (full-year): R. Campbell

PHIL 5105 Ethics (half year): N. Brett

PHIL 5170 Theories of Feminism: S. Sherwin

PHIL 5211 Philosophy of Law: N. Brett

PHIL 5280 Ethics and Education: W. Hare

PHIL 5300 Philosophy of Language: T. Tomkow

PHIL 5438 Rousseau: D. Braybrooke

PHIL 5440 Philosophy of Mind: R. Martin

PHIL 5460 Mind and Brain: R. Puccetti

PHIL 5530 Freedom, Action and Responsibility: P.K. Schotch

PHIL 5630 History of Philosophy: Kant: T. Vinci

PHIL 5640 History of Philosophy: 20th Century Philosophy: D. MacIntosh

PHIL 5670 Philosophy of Science: staff

PHIL 5720 Phenomenology of Literature: M. Fry

PHIL 5801A/B Ethics and Health Care: S. Sherwin

PHIL 5810 Open-Mindedness and Education: W. Hare

PHIL 5851 Metaphysics: D. T. Tomkow

PHIL 5900 Logic: Logic and Philosophical Analysis: T. Tomkow

**Seminar Classes**

PHIL 5055 Topics in Epistemology

PHIL 5070 Topics in Philosophical Psychology

PHIL 5080 Topics in Logical Theory

PHIL 5115 Topics in Ethics I

PHIL 5120 Theory of Rational Decision

PHIL 5125 Topics in Ethics II

PHIL 5190 Topics in the History of Philosophy I

PHIL 5191 Topics in the History of Philosophy II

PHIL 5192 Topics in the History of Philosophy III

PHIL 5200 Topics in Normative Theory

PHIL 5215 Topics in Philosophy of Law

PHIL 5220 Contemporary Philosophical Issues

PHIL 5430 Game Theory as a Foundation for Ethics & Politics

PHIL 5470 Utilitarianism, Liberalism, & Democracy

PHIL 5480 Social Choice Theory

PHIL 5500A/B Topics in Feminist Philosophy: S. Sherwin

PHIL 5510 Topics in Philosophy of Language

PHIL 5600 Philosophy of Religion Seminar

**PHIL 5680 Topics in Philosophy of Science**

**PHIL 5855 Topics in Metaphysics**

**Directed Reading Classes**

**PHIL 5960/5980 (half year); 5970/5990 (full year)**

**PHIL 9000 MA Thesis**

**PHIL 9530 PhD Thesis**

## Physics

**Location:** Sir James Dunn Science Building  
Halifax, N.S. B3H 3J5

**Telephone:** (902) 494-2337

**Fax:** (902) 494-5191

**Chairperson of Department**

A.M. Simpson

**Graduate Advisor**

R.A. Dunlap

**Emeritus Professor**

W.J. Archibald, MA (Dal), PhD (Virg.), DSc (UNB), DSc (Dal), FRSC

**Professors**

D.D. Betts, MSc (Dal), PhD (McG), FRSC, Dean of Faculty of Science

B.L. Blackford, BSc(Acad), MSc(MIT), PhD (Dal)

M.G. Calkin, MSc (Dal), PhD (UBC)

P. Chylek, Physics Diploma (Charles U., Prague), PhD (U. of Calif. at Riverside) cross appointment with Oceanography

D.J.W. Geldart, BSc (Acad.), PhD (McM), FRSC,

A.C. Fales Professor of Theoretical Physics

M.H. Jericho, MSc (Dal), PhD (Cantab.), George

Munro Professor of Physics

D.B.L. Kiang, BSc (Mt. A), MSc, PhD (McM)

H.J. Kreuzer, MSc, DSc (Bonn)

G.F.O. Langstroth, BSc (Alta), MSc (Dal), PhD (Lond)

R.H. March, BSc, MSc (Dal), DPhil (Oxon.)

B.E. Paion, BSc, MSc (Waterloo), PhD (McG)

R. Ravindra, BSc (Kharapur), MA, PhD (Tor.),

Cross appointment with Comparative Religion

A.M. Simpson, BA (Cantab.), MSc, PhD (Dal)

G. Stroink, BSc, MSc (Delft), PhD (McG), PEng

**Associate Professors**

J.G. Cordes, MSc (Dal), PhD (Cantab.)

R. A. Dunlap, BS (Worcester), AM (Dartmouth), PhD (Clark)

D.F. Goble, BSc/MSc(Alta), PhD(Tor), BEd (Dal)

P.H. Reynolds, BSc (Tor.), PhD (UBC), Joint appointment with Geology

D.A. Tindall, BA, PhD (Cantab.)

C.G. White, BSc, MSc (Dal)

M.A. White, BSc (UWO), PhD (McMaster),

Cross appointment with Chemistry

**Assistant Professors**

W.T. Hyde, BSc (Tor.), MSc (Waterloo), PhD (Tor.), Joint appointment with Oceanography

D. Labrie, MSc, PhD (McMaster)

G. Lesina, MSc, PhD (Tor), Joint appointment with Oceanography

**Research Associates**

A.K. Das, DPhil (Oxon.)  
 P. Mulhern, PhD (UBC)  
 S.H. Payne, PhD (Cantab.)  
 M. Shegelski, PhD (UBC)  
 L. Wang, MSc (E. China)  
 A. Wlezbicki, PhD (A. Mickiewicz, Poland)  
**E.B. Eastburn Fellow**  
 M.A. White, BSc (UWO), PhD (McMaster)

**Senior Instructors**

F.M. Fyfe, MSc (Dal)  
 W. Zukauskas, BSc (Dal)

**Adjunct Professors**

H.W. King, BSc, PhD (Birm.), DIC (Lond.),  
 FRSA, F.Inst.P., F.I.M., CEng, PEng, TUNS  
 A.D.J. O'Neill, MSc (McG), PhD (Saak.),  
 Atmospheric Environment Services

**MacGregor Teaching Fellows**

T. Craig  
 L. Gates  
 L. Levesque  
 X. Wang

**Admission Requirements**

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. An MSc is the normal admission requirement for the PhD programme.

It is recommended that all foreign students provide the Department with an official copy of the Advanced Graduate Record Examination in Physics. In some cases this will be made a precondition to consideration of the student's application for admission.

**MSc Degree Programme**

For minimum time required to complete this programme, see Section 6.

At least two and one half graduate classes are required, of which at least one and a half must be at the 6000 level.

An oral examination on the subject matter of the thesis is required.

A research thesis is required.

**PhD Degree Programme**

For minimum time required to complete this programme, see Section 6.

Normally, a minimum of three graduate classes is required, of which at least two must be at the 6000 level.

Within the first year of a PhD programme (and as soon as possible after a Dalhousie MSc), the candidate must take a preliminary oral examination.

Research and the preparation and oral defense of a thesis are required.

The PhD degree will be granted primarily on

the basis of the candidate's ability to carry through original investigation. Part of the evidence of this will be acceptance of scientific material for publication in refereed journals and the preparation of a satisfactory thesis.

**Classes Offered**

5000-level classes are fourth-year undergraduate classes which may be taken for graduate credit in certain circumstances. They are normally taken by new graduate students having background deficiencies in specific areas. 6000-level classes are full graduate classes.

All graduate students will normally take a Problems Class (6320C or 6330C) once in each degree programme.

All graduate students are required to attend regular departmental seminars.

**PHYC 5100A/B Electrodynamics:** lecture, 3 hours, Prerequisite: Physics 2110, 2120 prior to 1990, or Physics 2000A/2010B, and Math 3110A/3120B, or the permission of the instructor

**PHYC 5151A Quantum Mechanics:** lecture 2 hours, Prerequisite: Physics 3140A or permission of instructor

**PHYC 5152B Quantum Mechanics:** lecture 2 hours, Prerequisite: Physics 5151A

**PHYC 5160A Mathematical Methods of Physics:** lecture 3 hours, Prerequisite: Mathematics 3110A/3120B or permission of instructor

**PHYC 5170B Topics in Mathematical Physics:** lecture 3 hours, Prerequisite: Physics 5160A

**PHYC 5180A or B Nuclear and Particle Physics:** lecture 3 hours, Prerequisite: Physics 3140A or permission of instructor

**PHYC 5220A Microcomputer Based Instrumentation:** lecture 2 hours, lab 3 hours, Prerequisite: Physics 3810B or permission of instructor, this class is not given every year

**PHYC 5230A/B Introduction to Solid State Physics:** lecture 3 hours, Prerequisite: Physics 3140A or permission of instructor

**PHYC 5311A/5312B Fluid Dynamics I/II:** lecture 3 hours, Cross listed: Oceanography 5311A/5312B

**PHYC 5411A/5412B Dynamic Meteorology VII:** lecture 3 hours, Prerequisite: permission of instructor, Crosslisted: OCEA 5411A/5412B

**PHYC 5460A/B Optics:** lec 3 hours, Prerequisite: Physics 3440A/B or permission of instructor

**PHYC 5480A/B Applied Group Theory:** lecture 3 hours, Offered when there is sufficient demand



## 120 Physics

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**PHYC 5500A/5510B Atmospheric Physics I/II:** lecture 3 hours, Prerequisite: permission of instructor, Cross listed with Oceanography 5500A/5510B

**PHYC 5520A Introduction to Meteorology:** lecture 3 hours, Prerequisite: permission of instructor, Cross listed with Oceanography 5520A.

**PHYC 5530B Introduction to Radiation and Climate:** lecture 3 hours, Prerequisite: permission of instructor, Cross listed with Oceanography 5530B

**PHYC 5540A/5550B Synoptic Meteorology I/II:** lecture 3 hours, Prerequisite: at least 1 third year level physics

**PHYC 5650A/5660B Relativity and Cosmology:** lecture 3 hours, Prerequisite: Physics 2110 and 2120 prior to 1990, or Physics 2000A/2010B, Mathematics 3050R, or permission of instructor

**PHYC 6100 Nuclear Physics:** lecture 2 hours

**PHYC 6120 Quantum Theory:** lecture 3 hours, Prerequisite: Physics 4150A or its equivalent

**PHYC 6141A/6142B Advanced Quantum Theory I/II:** lecture 3 hours, Prerequisite: Physics 6120, which may be taken concurrently

**PHYC 6201A/6202B Solid State Physics I/II:** lecture 2 hours, Prerequisite: Physics 5230B, 4150A

**PHYC 6241A/6242B Advanced Solid State Physics I/II**

**PHYC 6261A/6262B Statistical Mechanics I/II:** lecture 3 hours, Prerequisite: Physics 3210B, 4150A or their equivalent

**PHYC 6300R Electromagnetism:** lecture 3 hours

**PHYC 6320C Advanced Problems (MSc students)**

**PHYC 6330C Advanced Problems (PhD students)**

The following 6000 level classes are more specialized than the above and, consequently are not offered as frequently.

**PHYC 6270A Order-Disorder Phenomena and Phase Transitions:** Prerequisite: A basic knowledge of quantum statistical mechanics is assumed

**PHYC 6271B Field Theoretical Methods in Critical Phenomena**

**PHYC 6280A/B Superconductivity:** lecture 2 hours

**PHYC 6291A Surface Science I**

**PHYC 6292B Surface Science II**

**PHYC 6350B Selected Topics in Physical Metallurgy:** lecture 2 hours

**PHYC 6500C Magnetism:** lecture 1½ hours

**PHYC 6570A Light Scattering and Radiative Transfer:** Crosslisted with Oceanography 5570A

**PHYC 6580B Cloud Physics.** Crosslisted with Oceanography 5580B

**PHYC 6600B Topics in Physics**

**PHYC 6710A/B Introduction to Disordered Materials**

**PHYC 6970 Selected Topics in Particle Physics:** lecture 2 hours

**PHYC 9000 MSc Thesis**

**PHYC 9530 PhD Thesis**

## Physiology and Biophysics

**Location:** Sir Charles Tupper Building, 3rd Floor  
Halifax, N.S. B3H 4H7  
**Telephone:** (902) 494-3517

**Head of Department**  
T.F. McDonald

### Professors Emeritus

Bela Insekutz, Jr., MD (Szeged), Dr Med (Bud.)  
Enid MacLeod, MD (Dal)  
C.B. Weld, MA (UBC), MD (Tor.), FRSC

### Professors

J.A. Armour, BSc (McG), MD (UWO), PhD (Loyola)  
B.M. Horacek, MSc (Eng.) (Prague), PhD (Dal)  
M. Horackova, MSc, PhD (Prague)  
G.A. Klassen, MD (UBC), FRCP(C), Major appointment Dept. of Medicine  
T.F. McDonald, BSc (U of Alta.), PhD (Dal), DIC (Imperial College)  
W.H. Moger, BS (Cornell), PhD (U of Calif.)  
R. Rosen, BSc (Brooklyn Col), MA (Col), PhD (U Chic)  
J.C. Szerb, MD (Munich), FRCP(C)  
M. Wilkinson, BSc (Southampton), PhD (Lond.)  
H. Wolf, Dipl Eng (Munich), PhD (Dal)  
A.Y.K. Wong, MSc, PhD (Dal)

### Associate Professors

R.E. Brown, BSc (U of Victoria), MA, PhD (Dal)  
A. Corvin, MD (Heidelberg)  
R.P. Croll, PhD (McGill)  
J.D. Dudar, MSc (Alta.), PhD (Dal), Graduate Studies Coordinator  
A. Fine, BA (Harvard), DVM, PhD (U Penn)  
D. Guernsey, PhD (Hawaii), Major appointment in Pathology  
J.G. Holland, BSc, MD (Dal)  
W. Ling, BSc (Acad. U), MSc, PhD (McG), Major appointment, Obstetrics/Gynecology  
D. Pelzer, MD (Heidelberg)  
D. Rasmussen, BA (Colo. C), PhD (Dal)  
G. Strolink, PhD (McG), Major appointment, Dept. of Physics

### Assistant Professors

A. Bonen, PhD (U of Ill.), Major appointment, School of Physical Education  
M. Dickie, BA, MA, PhD (Tor.)  
M. Gardner, MD FRCP(C), FACC (Dal), Major appointment Dept. of Medicine.  
D. Hirsch, MD (Dal), Major appointment, Department of Medicine  
D.E. Johnstone, B.Sc, MDCM (McG), FRCP(C), Major appointment, Department of Medicine  
A. Kholopov, MSc (Moscow State Univ.) PhD (USSR Acad. of Sci.)

K. Landymore, BSc, MD, PhD (Dal), Major appointment Obstetrics/Gynecology  
S. Martin, PhD (U of Calgary), Major appointment, Dept of Biology, Mt. St. Vincent  
N. Morgunov, BSc, MSc, PhD (U of Tor.)  
M.G. Murphy, MSc, PhD (Dal)  
P. Murphy, MSc, PhD (Dal)  
M.R. Oulton, BA (Acad. U), PhD (Dal), Major appointment, Obstetrics/Gynecology  
S. Pelzer, BSc, MSc, PhD (U. of Freiburg)  
R. Rittmaster, MD (Tufts Med. Sch.), Major appointment, Dept. of Medicine  
A.M. Taylor, BSc (Acad. U), DVM (Ont Vet Col)

### Adjunct Professor

P.M. Rautaharju, MD (Helsinki), PhD (Minn.)  
Univ. of Alberta.

### Lecturers

D. Fay, BSc (Mt.A), BEng (TUNIS), MSc, PhD (Sussex), MD (Dal)  
S.P. Handa, MD (Punjab), FRCP(C), FACP

### Instructor

C. Couture, BA (Dal)

Information on research interests in the Department and openings for graduate and post-PhD or post-MD study should be requested from the Graduate Coordinator of the Department.

### Admission Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies.

The following constitutes the minimum entrance requirements for the graduate programme in Physiology and Biophysics:

- a) An average mark of B<sup>+</sup>, with no mark below B<sup>-</sup> in the following basic undergraduate courses or their equivalent:
  - Mathematics 1000/1010 (differential and integral calculus)
  - Physics 1100 (using differential calculus)
  - Chemistry 110 (general chemistry)
  - Statistics 1060/1070 (basic statistics for scientists)
  - Biology 1000 (general biology)
  - Expository English (essay writing class)
- b) A minimum average mark of A<sup>-</sup> over the last two years of the student's undergraduate programme.

### MSc Degree Programme

For the minimum time required to complete this programme, see Section 6. Students should, however, expect to spend two years working toward the MSc.

Students who have not completed upper level classes in human physiology with at least a grade of B<sup>-</sup> will be required to complete Physiology 4403R Human Physiology. Students are also

# 122 Physiology & Biophysics

required to take Cellular and Molecular Physiology 5502R, Graduate Seminar 5517C and two half courses, one of which must be from the classes listed below.

A research thesis which constitutes two credits is required.

## PhD Degree Programme

For minimum time required to complete this programme, see Section 6.

Selected classes of this or other departments may be required.

A preliminary examination in the field of thesis research is required.

Research and the preparation and defense of a thesis are required.

A candidate must demonstrate the ability to carry out research of high quality leading to an advance in knowledge of physiology and biophysics.

## MD/PhD Combined Programme

For information on the combined MD/PhD programme see "Joint Programmes" (page 47).

## Classes Offered

### Physiology

**PHYL 4403R Human Physiology:** N. Morgunov. (Cross-listed with Biomedical Engineering at TUNS, BME6250)

**PHYL 5459B Activity of Excitable Cells and Tissues:** A. Wong (offered every second year, next offered in 1992/93. Cross-listed with Biomedical Engineering at TUNS)

**PHYL 5494B Synaptic Transmitters:** J. Szerb and M. Wilkinson (offered every second year, next offered in 1991/92)

**PHYL 5502R Cellular and Molecular Physiology:** M. Wilkinson (offered every year)

**PHYL 5503C Neurophysiology (Part 1):** J. Szerb (offered every year)

**PHYL 5505A Lab Animal Medicine: Comparative Physiology:** A.M. Taylor (offered every second year, next offered in 1992/93)

**PHYL 5508C/5509C/5510C Directed Reading in Physiology and Biophysics:** Staff

**PHYL 5511B Neurophysiology (Part 2):** J. Dudar, D. Raamunson, J.C. Szerb, A. Fine (offered every second year, next offered in 1991/92)

**PHYL 5512B Physiology and Biophysics of the Heart and Circulation:** D. Armour (offered every

second year, next offered in 1991/92)

**PHYL 5513A Endocrine Physiology:** W. Moger (offered every second year, next offered in 1992/93)

**PHYL 5514B Reproductive Physiology:** M. Wilkinson (offered every second year, next offered in 1991/92)

**PHYL 5517C Physiology and Biophysics Graduate Seminar:** Graduate Coordinator

**PHYL 5608R/5609R/5610R Directed Reading Graduate Seminar:** Staff

**PHYL 9000 MSc Thesis**

**PHYL 9530 PhD Thesis**

### Biophysics

The following classes are given by the Biomedical Engineering Institute at the Technical University of Nova Scotia.

**BIOP 5900A Biomedical Engineering I**

**BIOP 5910B Biomedical Engineering II**

**BIOP 5920B Medical Instrumentation**

**BIOP 5930A Digital Signal Processing I**

**BIOP 5940B Digital Signal Processing II**

**BIOP 5950A Biomechanics I**

**BIOP 5960B Biomechanics II**

**BIOP 5970A/B Directed Studies in Electrical Engineering**

## Political Science

**Location:** Arts & Administration Bldg, 3rd Floor  
6299 South Street  
Halifax, N.S. B3H 4H6  
**Telephone:** (902) 494-2396

**Chairperson of Department**  
R. Boardman

**Faculty Advisor:** David M. Cameron (Graduate)

### Professors Emeritus

J.H. Alchison, BA, BEd (Saak), BSc (Lond), PhD (Tor)  
J.M. Beck, BA (Acad.), MA, PhD (Tor.), LL.D (Dal), FRSC  
E.Mann Borgese, Dip.Mus. (Zurich), LHD (Mt.S.V.)  
D. Braybrooke, BA(Harv), MA,PhD(Corn), FRSC

### Professors

P.C. Aucoin, BA (SMU), MA (Dal), PhD (Queen's), jointly with Public Administration  
H. Bakvis, BA Hons (Queen's), MA, PhD (UBC)  
R. Boardman, BSc, PhD (Lond.)  
D.M. Cameron, BA (Queen's), MA, PhilM, PhD (Tor.) Graduate Coordinator  
J.G. Hayra, BA (Tor.), AM, PhD (Col.), FRSC (Eric Dennis Memorial Professor of Government and Political Science)  
T.M. Shaw, BA (Sussex), MA (East Africa, Prin.), PhD (Prin.)  
D.W. Stairs, BA (Dal), MA (Oxon.), PhD (Tor.), FRSC (Vice-President, Academic and Research)  
G.R. Winham, BA (Bowdoin), Dip in Int Law (Manc.), PhD (N'Car.)

### Associate Professors

D.F. Luks, BSc (Hons.), MSc, PhD (London)  
D.W. Middlemiss, BA, MA, PhD (Tor.) (Director, Centre for Foreign Policy Studies)  
J. Smith, BA (McM), MA, PhD (Dal)

### Assistant Professors

B.L. Crowley, BA (McGill), MSc, PhD (London)  
R.G. Finbow, BA (Dal), MA (York), PhD (Lond)

### Assistant Professor (Research)

A. Heard, BA (Dal), MA (London), PhD (Tor)

## Admission Requirements

In addition to the regular application requirements, all candidates must provide the Departmental Admissions Committee with (1) a brief statement of their intended programme of studies, and, especially, their thesis/dissertation interests; and, (2) a sample of their written work (for applicants to the PhD programme, their MA

thesis or parts thereof would be desirable). The Admissions Committee will consider an application incomplete until these requirements are met.

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. For admission to the one year MA degree programme, candidates must possess an Honours degree in Political Science. Candidates with an undergraduate major in Political Science or the equivalent (at least four full year credits in Political Science), or an Honours degree in a discipline other than Political Science, and with at least four full year credits in Political Science, may apply for a two year MA degree programme.

For admission to the PhD degree programme, candidates must possess an MA in Political Science, or, in exceptional cases, a Masters degree in a related discipline with a significant component of Political Science, e.g., a Masters in Public Administration or International Affairs. The Department does not admit candidates to the PhD degree programme directly from an undergraduate Honours degree.

In all cases, first class or high second class grades are required.

### MA Degree Programme

The one year MA degree consists of three full credits of courses, including the core course in the student's area of specialization, and a two-credit thesis. The two year MA consists of the above requirements for the one-year MA degree and as many as five additional full-year credits of courses. Students may specialize in Political Theory and Philosophy, Canadian Government, Comparative Government, International Relations and Foreign Policy, or Public Administration.

### PhD Degree Programme

The PhD programme requires two years of full time residency. The first year course requirements consist of three full credits of courses, including two core courses in a student's field of specialization for comprehensive examinations, and one course in Political Philosophy if this is not a field selected for comprehensive examination. Comprehensive papers and examinations must be completed in three of the following fields: Political Theory, Philosophy and Methods; Canadian Government; Comparative Government (in selected areas); International Relations and Foreign Policy; Public Administration; and Special Alternate Field (where faculty interests and resources permit). A dissertation must be prepared and defended in one of the above areas. Candidates will be admitted to the PhD degree programme only where the topic of the dissertation can be adequately supervised by Departmental faculty. Proficiency in a language other than English, usually French, must be demonstrated.

### Classes Offered

Classes offered by the Department have been grouped into the following classifications:

- Canadian Government and Politics and Public Administration
- Comparative Politics
- Political Theory and Methodology
- International Relations and Foreign Policy

Note: Classes are not necessarily offered each year. Please consult timetable.

#### Canadian Government and Politics

OPL 520MR Adv. Seminar in Canadian Politics:  
P. Aucoin and D. Cameron

POL5205A/B Canadian Political Thought: J. Smith

POL 5206A/B Constitutional Issues in Canadian Politics: J. Smith

POL 5208A/B Canadian Provincial Politics: Staff

POL 5212A/B The Politics and Government of Nova Scotia: P. Aucoin

POL 5216A/B Local and Regional Government: D. Cameron

POL 5220A/B Intergovernmental Relations in Canada: H. Bakvis

POL5224A/B Canadian Political Parties: H. Bakvis

POL 5228A/B Interest Groups: Representation, Management and Function: H. Bakvis

POL 5235A/B Regional Political Economy in Canada: R. Finbow

POL5240A Policy Formation in Canada: P. Brown

POL 5241B Intro to Policy Analysis: P. Pross

POL 5245A/B Judicial Systems: A. Heard

POL 5250A/B Canadian Public Admin: P. Aucoin

#### Comparative Politics

POL 5301A/B Comparative Theory: R. Finbow

POL 5302A/B Comparative Development Administration: D. Luke

POL5303A/B Human Rights & Politics: A. Heard

POL 5304A/B Comparative Federalism: H. Bakvis

POL 5315A/B African Politics: staff

POL 5340A/B Problems of Development: T. Shaw

POL 5360A/B Politics in Latin America: staff

#### Political Theory and Methodology

POL 5331A/B The Political Imagination in Literature: B. Crowley

POL 5430A/B The Political Philosophy of Plato: B. Crowley

POL 5435A/B Machiavellian Politics: Staff

POL 5438A/B Rousseau and the Founding of Modern Democracy: Staff

POL 5479A/B Classical Liberalism and Democracy: Staff

5496A/B Philosophy of the Social Sciences: Staff

#### International Relations & Foreign Policy

POL 5520R Theories of International Relations: G. Winham

POL 5531A/B The United Nations in World Politics: R. Boardman

POL 5535A/B The New International Division of Labour: T. Shaw

POL 5537R Management and Conservation of Marine Resources: E.M. Borgese. Offered as a summer class only; consult instructor.

POL 5540A/B Foreign Policies of African States: T. Shaw

POL 5544A/B Political Economy of Southern Africa: T. Shaw

POL 5570R Canadian Foreign Policy: D. Stairs

POL 5571R Strategy and Canadian Defence Policy: D. Middlemiss

POL 5572R American Foreign Policy: G. Winham

POL 5575A/B Nuclear Weapons and Arms Control in World Politics: D. Middlemiss

POL 5585A/B Politics of the Environment: R. Boardman

POL 5590R The Politics of the Sea: E.M. Borgese

5595R Theories of War and Peace: Staff

POL 5601R Readings in Political Science

POL 5602A Readings in Political Science

POL 5603B Readings in Political Science

POL 9000 MA Thesis

POL 9530 PhD Thesis

## Psychology

**Location:** Life Science Building  
1355 Oxford Street  
Halifax, N.S. B3H 4J1

**Telephone:** (902) 494-3417

**Chairperson of Department**  
R.E. Brown

### Professors

R.E. Brown, BSc (Victoria), MA, PhD (Dal)  
P.J. Dunham, BA (DePauw), MA, PhD (Missouri)  
J.C. Fennessy, BA (Amherst), PhD (Cantab.)  
W.K. Honig, BA (Swarthmore), PhD (Duke)  
R. Klein, BA (SUNY), MA, PhD (Oregon),  
Graduate Studies Coordinator  
M. Leiter, BA (Duke), MA (Vanderbilt), PhD  
(Oregon), Major appointment with Acadia Univ.  
V.M. LoLordo, AB (Brown), PhD (Penn.)  
P. McGrath, BA, MA (Sask), PhD (Queen's)  
J.A. McNulty, BA, MA, PhD (Tor.)  
I.A. Meinertzhagen, BSc (Aberdeen), PhD (St.  
Andrews)  
D.E. Mitchell, BSc/M.App.Sc. (Melb), PhD (Berkeley)  
S. Nakajima, BA (Chiba), MA (Wash), PhD (McG)  
K.E. Renner, BS (Penn.), MA, PhD (Northwest)  
H. Robertson, MSc (UWO), PhD (Cantab),  
Cross-listed with Pharmacology  
R.S. Rodger, MA (Edin.), PhD (Belf.)  
B. Rusak, BA (Tor.), PhD (Berkeley)  
M.G. Yoon, BS (Seoul), PhD (Berkeley)

### Associate Professors

J. Barres, BS (Brown), MA (S Cal), PhD (Wisc.)  
S. Bryson, BA (Guelph), PhD (McG)  
J.W. Clark, BA, MA (McG), PhD (Qu.)  
A.J. Cohen, BA (McG), MA, PhD (Qu.)  
J.F. Connolly, BA (Holy Cross), MA (Sask), PhD  
(Lond)  
R. Croll, BSc (Tufts), PhD (McG), Cross-listed  
with Physiology/Biophysics  
B. Earhard, BA, MA, PhD (Tor.)  
A. Fine, BA (Harvard), DVM, PhD (U Penn),  
Cross-listed with Physiology/Biophysics  
B.R. Moore, AB (Emory), PhD (Stan.)  
M. Ozier, BA, MA, PhD (Tor.)  
D.P. Phillips, BSc, PhD (Monash)  
D. Rasmussen, BA (Colo. C), MA, PhD (Dal),  
Cross-listed with Physiology/Biophysics  
K. Semba, BEd, MA (Tokyo), PhD (Rutgers),  
Cross-listed with Anatomy  
S. Shaw, BSc (London), PhD (St. Andrews)

### Assistant Professors

P. McMullen, MSc (Tor.), PhD (Waterloo)  
C. Moore, BA (Emory), PhD (Cantab)  
M. Sullivan, MA, PhD (Concordia)

### Adjunct Professors

J. Backman, MA/PhD (Carl), Educ/Prov. of NS  
C. Blisbury, BSc/PhD (Liverpool), Psych/Camp  
Hill  
S.E. Bryson, BA (Guelph), PhD (McG),  
Psych/Guelph  
J.M. Byrne, MA, PhD (Kansas), Psych/TWK  
C. Ellsworth, MA, PhD (Queen's), Psych/TWK  
J. Flak, BSc, MA, PhD (UWO), Psych/Camp Hill  
G.W. MacDonald, BA (St. F.X.), MA, PhD  
(Windsor), Psych/TWK  
C.C. Mate-Kole, BSc (Bruner), PhD (Leicester),  
Psych/Rehab Centre  
J.R. Mathews, BSc (Syracuse), MSc (S.M.U.),  
MA, PhD (Kansas), Psych/TWK  
P. O'Neill, MSc, PhD (Yale), Psych/Acadia  
S. Pigott, BA (UWO), PhD (McG), Psych/VG  
G. Pretty, BSc/MSc (Acad), PhD (UWO), Psych/SMU  
P. Ritvo, MA (Calif. State), PhD (Calif. Sch. Prof.  
Psych.), Psychology/Psychiatry/Camp Hill  
M. Schwartz, BSc (McG), MA, PhD (Waterloo),  
Psych/VG  
T.M. Vallis, BSc (Dal), MA, PhD (UWO),  
Psych/Camp Hill

### Senior Instructors

G. Eakes, BA, PhD (Berkeley)  
R.S. Hoffman, BSc (Col. Coll.), MA (Dal)

### Instructor

L. Leary, BSc (Dal), MSc (Mem), PhD (Adelaide)

### Postdoctoral Fellows

H. Abe, PhD (Nagoya)  
H. Brandstätter, PhD (Graz)  
A. Kingstone, PhD (Manchester)  
E. Pyza, PhD (Krakow)  
P. Rajashekhar, PhD (Bangalore)  
C. Ryan, PhD (Carleton)  
D. Williams, BA (Man.), PhD (Min.)

## Admission Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies.

### MSc/MA Degree Programme

Students are expected to complete the MSc/MA programme within 12 months from their admission.

All candidates for the MSc/MA degree in general experimental psychology take Statistics and Experimental Design (6000) and at least two other classes in the 6000 series.

All MSc/MA candidates are expected to gain a basic competence in computer programming, and competence in the use of Fortran is a prerequisite to admission to the class Statistics and Experimental Design.

A thesis is required.

Students whose background is inadequate will be required to complete appropriate

undergraduate classes designated by the Department. The Department does not offer a degree in Clinical Psychology at the Masters level.

**PhD Degree Programme in Psychology**

For minimum time required to complete this programme, see Section 6.

While the PhD thesis is the main focus of the programme, the candidate in consultation with his/her thesis supervisor chooses a minor area of study from the classes offered by other departments in Dalhousie University.

Students are required to pass a comprehensive examination at least one year before submission of the thesis. The form of this examination is flexible and is conducted by an examination committee of between three and five faculty members.

Candidates are encouraged to enrol in graduate seminars selected from the 8000 series during each year of PhD study.

Research and preparation and oral defence of a dissertation are required.

**PhD Programme in Clinical Psychology**

The programme in Clinical Psychology is designed according to the "scientist-practitioner" model. It is a structured, 5-year programme leading to a PhD degree. During the first 4 years of the programme, students complete the required classes, conduct supervised and thesis research and gain clinical experience through field placements. In the fifth year, students are placed in a full-year clinical internship. In addition to the Clinical Psychology requirements, students must meet all the requirements for the PhD degree programme in Psychology.

**Classes Offered**

**PSY 5000R Research Assignment:** Staff

**PSY 5001A Independent Study:** Staff

**PSY 5002B Independent Study:** Staff

**PSY 6000R Statistics and Experimental Design:** R.S. Rodger

**PSY 6020A/B Application of Experimental Clinical Procedures:** K.E. Renner

**PSY 6040R Animal Learning:** W.K. Hong

**PSY 6050R Perception:** D.E. Mitchell

**PSY 6051A/B Neural Basis of Perception:** D. Phillips

**PSY 6060A/B Biological Basis of Mental Illness:** J. Connolly, B. Rusak

**PSY 6070R Physiological Psychology:** S. Nakajima

**PSY 6081A/B Topics in Personality and Social Psychology:** J. Barreal

**PSY 6090R Biosocial Issues in Devel:** P. Dunham

**PSY 6091A/B Topics in Child Development:** P. Dunham, C. Moore

**PSY 6160A/B Instrumentation and Computers in Psychology:** D. Conrad, R. Hoffman

**PSY 6130R Cognitive Psychology:** R. Klein

**PSY 6160A/B Comparative Psychology:** R. Brown, J. Fentress

**PSY 6201A/B Introduction to Psychological Assessment:** P. Ritvo

**PSY 6202A/B Introduction to Psychological Intervention:** J. Connolly

**PSY 6210A/B Introductory Clinical Seminar:** P. McGrath

**PSY 6211A/B Topics in Assessment:** J. Connolly

**PSY 6230A/B Psychology of Reading:** R. Klein

**PSY6240A/B Topics in Animal Learning:** W. Hong

**PSY 6270A/B Comparative Neurobiology:** I.A. Meinertzhagen, S.R. Shaw

**PSY 6300R Cognitive Neuropsychology:** R. Klein

**PSY 6313A/B Topics in Cognitive Psychology:** R. Klein

**PSY 6370A/B Neuroscience Lab:** M.G. Yoon

**PSY 6410A/B Topics in Therapeutic Intervention:** Staff

**PSY 6420A/B Topics in Health Psychology:** Staff

**PSY 6470A/B Developmental Neuroscience:** I.A. Meinertzhagen, S.R. Shaw

**PSY 6580R History of Psychology:** J.W. Clark

**PSY 6801A/B Dissociative Disorders:** R. Klein

**PSY6802A/B Topics in Schizophrenia:** J. Connolly

**PSY 6803A/B Topics in Psychopathology:** M. Sullivan

**PSY 6804A/B Topics in Neuropsychology:** J. McGlone

PSY 6810A/B Topics in Clinical Research  
 Methods: P. McGrath

PSY 6802A/B Topics in Community Psychology:  
 K.E. Renner

PSY 7100A/B Teaching Methods Seminar: P.  
 Dunham

PSY 7500R Proseminar: Methods of Psychological  
 Enquiry: R. Klein

PSY 8000R Psychology Colloquium: Staff

PSY 8040R Learning: W.K. Honig, V.M. LoLordo

PSY 8050A/B Selected Topics in Perception: D.  
 Mitchell

PSY 8070A/B Selected Topics in Physiological  
 Psychology: S. Nakajima

PSY 8081A/B Topics in Personality and Social  
 Psychology: J. Barreal

PSY 8090A/B Biosocial Processes in Development:  
 P. Dunham.

PSY 8091A/B Topics in Child Development: P.  
 Dunham, C. Moore

PSY 8100A/B Methodology in Psychology: R.S.  
 Rodger

PSY 8120A/B Clinical Methods and Issues: K.E.  
 Renner

PSY 8130A/B Human Learning/Information  
 Processing: B. Earhard, R. Klein, J. Barreal

PSY 8160A/B Ethology: R. Brown, J. Fentress

PSY 8201A/B Ethical and Professional Issues:  
 Staff

PSY 8211A/B Topics in Assessments: J. Connolly

PSY 8231A Field Placements: M. Leiter

PSY 8232B Field Placements: M. Leiter

PSY 8240A/B Topics in Animal Learning: V.  
 LoLordo

PSY 8313A/B Topics in Cognitive Psychology: R.  
 Klein

PSY 8410A/B Topics in Therapeutic Interventions:  
 Staff

PSY 8420A/B Topics in Health Psychology: Staff

PSY 8801A/B Topics in Clinical Research

Methods: P. McGrath

PSY 8802A/B Topics in Schizophrenia: J.  
 Connolly

PSY 8803A/B Topics in Psychopathology: M.  
 Sullivan

PSY 8804A/B Topics in Neuropsychology: J.  
 McGlone

PSY 8820A/B Topics in Community Psychology:  
 K.E. Renner

PSY 9000R MA Thesis

9530R PhD Thesis



## Public Administration

**Location:** 1229 LeMarchant Street  
Halifax, N.S. B3H 3J5  
**Telephone:** (902) 494-3742

### Director of School

Dale H. Poel

### Professors

P. Ancoin, BA (SMU), MA (Dal), PhD (Qu.)  
H. Bakvis, BA (Qu.), MA (UBC), PhD (UBC)  
A.A. Kwabong, BA, MA, PhD (Cantab) Lester  
Pearson Professor  
J.D. McNiven, MSc, PhD (Michigan) Dean,  
Faculty of Management  
A.P. Pross, BA, MA (Qu.), PhD (Tor.)

### Associate Professors

M.P. Brown, BA (MtA), MA (Dal), PhD (Tor.)  
D.H. Poel, BA (Calvin), MA (W Mich.), PhD  
(Iowa)

### Assistant Professors

A. M. Cassin, BA (Man), MA (UBC)  
F. Siddiq, BA, MA (Dhaka), PhD (Dal)

### Lecturers

S. Amirkhalkhal, BA (Shiraz, Iran), MA, PhD  
(Dal), St. Mary's Univ.  
K. Antoft, BA, MA (Dal)  
L. Currie, BSc (St. FX), MSW, MPA (Dal)  
R.S. Gunn, B.Comm. (Dal), CA  
R. Moody, BComm (SMU), MPA (Dal)  
D. Naulls, BA, MA (Wilfred Laurier), PhD  
(York) Saint Mary's Univ.  
A. O'Brien, BSc, LLD (Dal)  
D. M. Stuewe, BA (Dal), MA (Carleton)  
T. Vey, CMA

### Adjunct Professor

T.W. Kent, MA (Oxon.), LLD (Dal)

Students seeking further information or help in planning courses of study in the School of Public Administration should address themselves to:

Graduate Co-ordinator  
School of Public Administration  
1229 LeMarchant Street  
Halifax, Nova Scotia B3H 3J5  
(902-494-3742)

## Degree Programmes

The graduate programmes of the School are designed to provide the professional education essential to a career in modern public service. They are offered to students who either are preparing for initial employment or are returning to university with work experience.

The programmes are professional in that they

equip students with both the administrative skills required in public sector management and an understanding of the organization, process, and activities of government. Each component is essential, and consequently required of all students. They are expected to achieve an expanded awareness of the public interest and a personal appreciation of the ethical standards appropriate to a career in the service of the public. The professional requirements have been developed in consultation with senior officials of all levels of government (including graduates of the School).

Students entering the School will be expected to acquire an education as well as a profession, a matter which is properly of particular concern for a university-based programme. Accordingly, admission requirements for the Diploma and the MPA are those of the Faculty of Graduate Studies, and its standards must be maintained throughout the duration of the programme. The quantity and quality of work expected in individual classes will reflect the high scholarly standards expected of graduate education.

The curriculum encompasses the essential components of financial, personnel and statistical techniques on the one hand, and economic, organizational and policy analysis on the other. The Diploma programme and the first year of the Masters programme require students to complete courses in these basic fields. The second year of the Masters programme offers the student the opportunity to pursue further studies in one or more of these fields and to concentrate her or his programme in light of career plans. The offerings of related programmes and disciplines, such as economics, planning, business administration, health services administration, education, social work, law, and resource management, can be used by students as desired and necessary. The second year may include a research project in the field of concentration.

## Joint MPA/LLB

The School and the Faculty of Law offer a joint MPA/LLB programme. The programme allows students to take the two degrees simultaneously and to complete them in four years, rather than in five years as is the case if each is taken independently. Students interested in entering the joint programme should apply separately to both the School and the Faculty, indicating in their applications that they wish to enter the MPA/LLB programme. The closing date for applications for the LLB is the end of February.

## Applications Procedure

Application forms are available from the Admissions Office of Dalhousie University. Applications should be submitted as early as possible.

## General Admission Requirement for DPA and MPA

Enrolment in the School is limited. In general, successful applicants should have attained a good second class standing (B+ average) in their previous university work.

Admission is based on an assessment of:

- professional experience and/or promise;
- all previous academic work;
- letters of reference;
- TOEFL for foreign students (Test of English as a Foreign Language);

Therefore, it is imperative that in addition to your application we receive:

- a statement of career interest (one page should be sufficient);
- a current resumé;
- at least two letters of reference (one of which should be academic);
- a TOEFL score (if applicable)

Students lacking a high second class standing (i.e. less than a B+ average) are strongly advised to submit a score from the Graduate Management Admission Test (GMAT) in support of their application.

The Test may be taken at conveniently-located centres throughout North America and in many other parts of the world. In the case of North American candidates, applications for the test are accepted by the ETS in Princeton until approximately six weeks before test dates. For candidates in other countries, closing dates are eight weeks before test dates.

School of Public Administration GMAT Number is 0957.

Applicants for the test should use an order form obtainable from the Registrar's Office of the nearest University, Dalhousie University, or you may write to the address below to obtain an information bulletin and registration form for the GMAT. If the order form is lost or omitted from the materials you receive, you should write directly to:

Graduate Management Admission Test  
Educational Testing Service  
Box 966  
Princeton, N.J., 08540, U.S.A.

Students are required to demonstrate at an early stage in their studies that they are proficient in writing reports and essays in English. Candidates from countries outside Canada whose mother tongue is not English will be required to take the Test of English as a Foreign Language as a requirement for admission. (See section 2 of this calendar.)

For further information, contact the Administrative Secretary of the School.

## Part-time Study

The programmes offered through the School are available to students on a part-time basis. A part-time student may enrol in up to two full

classes (or equivalent) in any one academic year.

In order to ensure that graduate students benefit from a reasonable concentration of their studies, part-time programmes leading to the DPA must be completed within four years, and part-time programmes leading to the MPA must be completed within six years.

## Further Information

Prospective applicants who do not meet the academic admission requirements of a graduate programme may wish to consider improving their qualification by means of a "special" programme in the Faculty of Arts and/or Science or by the Certificate in Public Administration in the Faculty of Management.

It should be emphasized that any such undertaking carries no assurance of subsequent admission to a graduate programme.

## The Diploma in Public Administration (DPA)

**Programme** The Diploma in Public Administration is a one-year graduate programme designed for public servants who hold a first degree, and for students wishing to obtain professional preparation for a career in public administration.

The DPA may also serve as a programme qualifying students for subsequent admission to the MPA with advanced standing.

## Course Requirements

The DPA requires the successful completion of five credits:

- PA 5100A Government Structure and Organization
- PA 5110B Public Sector Management
- PA 5120A Policy Formulation
- PA 5121B Introduction to Policy Analysis
- PA 5130A Applied Micro Economics
- PA 5131B Applied Macro Economics
- PA 5140A Quantitative Methods I
- PA 5141B Quantitative Methods II
- PA 5150A Public Sector Accounting
- PA 5151B Public Sector Financial Management
- PA 5000A Communication Skills (Non-credit)

When a student has a demonstrated competence in the area of a required class, an alternate class may be substituted if approved by the Graduate Co-ordinator.

## The Master of Public Administration (MPA) Degree Programme

The MPA is a graduate programme designed for individuals prepared to undertake advanced professional study. Individual programmes will

# 130 Public Administration

vary in content to reflect each student's background and interests, while at the same time recognizing the central principles and functions of public administration.

## Course Requirements

The MPA will require the successful completion of PA 5000A and 10 credit classes, which must include: PA 5100A, 5110B, 5120A, 5121B, 5130A, 5131B, 5140A, 5141B, 5150A, 5151B and 6000B. The remaining credits will be electives.

## Areas of Concentration

In the second year, students normally specialize in a concentrated programme, consisting of three credits in the field of specialization and electives, selected in consultation with the Graduate Co-ordinator. Concentrations are currently available in four areas: Personnel Management, Financial Management, Municipal Management, and Policy and Programme Management.

## Advanced Standing

Advanced Standing of up to five credits (one year) may be granted to students admitted with an Honours BA, DPA, Masters, or other professional degrees (MBA, MLS, MSW, LLB, etc.). This is the maximum that may be granted; the actual extent of advanced standing depends upon the programme of studies in the previous degree and the intended area of concentration within the MPA. Students are advised to seek advanced standing when they apply for admission.

## Classes Offered

**PADM 5000A Communication Skills in Business:** E. Pease

**PADM 5100A Government Structure and Organization:** P. Aucoin

**PADM 5110B Public Sector Management:** M. Cassin

**PADM 5120A Policy Formulation:** P. Brown

**PADM 5121B Introduction to Policy Analysis:** P. Pross

**PADM 5130A Applied Micro Economics:** F. Siddiq

**PADM 5131B Applied Macro Economics:** S. Amirkhalkhal

**PADM 5140A Quantitative Methods I:** H. Bakvis

**PADM 5141B Quantitative Methods II:** F. Siddiq

**PADM 5150A Public Sector Accounting:** T. Vey

**PADM 5151B Public Sector Financial Management:** R. Gunn

**PADM 6000B Senior Seminar in Public Administration:** staff

**PADM 6100A Financial Administration & Budgeting:** R. Moody

**PADM 6110A Public Sector Auditing:** R. Gunn

**PADM 6230A Intermediate Applied Economics I:** F. Siddiq

**PADM 6231B Intermediate Applied Economics II:** staff

**PADM 6235B Issues in Applied Economics:** F. Siddiq

**PADM 6400A Local Government:** D. Cameron

**PADM 6410B Municipal Management:** A. O'Brien

**PADM 6420B Municipal Financial Administration:** K. Antoft

**PADM 6500A Business & Government:** J. McNiven

**PADM 6505B Interest Groups:** H. Bakvis

**PADM 6510A Policy Analysis:** D. Stuewe

**PADM 6520A Programme Evaluation Seminar:** D. Poel

**PADM 6521B Programme Evaluation Practicum:** D. Poel

**PADM 6530A Natural Resource Administration:** P. Pross

**PADM 6535B Politics & Administration of Fisheries Management:** P. Pross

**PADM 6537A Environmental Policy:** P. Brown

**PADM 6540B Canadian Regional Development Policy:** F. Siddiq

**PADM 6600A Personnel Administration:** M. Cassin

**PADM 6610B Compensation & Collective Bargaining:** L. Currie

**PADM 6620A Women and Men and Management:** M. Cassin

**PADM 6625B Special Topics in Human Resource Management:** M. Cassin

**PADM 6750A Intergovernmental Relations:** H. Bakvis

**PADM 6755B Comparative Federalism:** Staff

**PADM 6775B Management of Sustainable Development:** A. Kwapong

**PADM 6780B International Development Administration:** D. Luke

**PADM 6785B Advanced Quantitative Methods:** F. Siddiq

**PADM 6800R Project:** staff

**PADM 6850R Internship:** P. Brown

**PADM 6900R Directed Reading:** staff

**PADM 6910A Directed Reading:** staff

**PADM 6920B Directed Reading:** staff

**PADM 6925A/B Management Information Systems:** staff

Not all classes are offered each year. Consult Department for current year offerings. In addition to the above, classes may be selected from other schools, departments, or faculties, subject to the approval of the Graduate Co-ordinator.

## Recreation, Physical and Health Education

**Location:** 6230 South Street  
Halifax, N.S. B3H 3H5  
**Telephone:** (902) 494-2152  
**Fax:** (902) 494-5120

**Director of School**  
A.J. Young

### Professors

R.P. Beazley, BA, BEd (Acadia), BPE (McM), MPE (Dal), EdD (Tennessee)  
E.G. Belzer, Jr., BS (West Chester), MS (Maryland), PhD (U.Ill.)  
A. Bonen, BA (W. Ont), MS, PhD (U. Ill.)  
Graduate Co-ordinator of Kinesiology  
L.E. Holt, BS, MS (Springfield), PhD (S Ill.)  
A. Richards, Dip PE (Carnegie Schl. PE, England), Teach. Cert. (Trent Park Coll.), MSc (Dal), EdD (Colorado) Head of the Leisure Studies Division.  
A.J. Young, BS (West Chester State Coll.), MS, PhD (Maryland)

### Associate Professors

H.C. Ballem, BPE (UNB), MSc (Dal)  
P.D. Campagna, BPHE (Windsor), BEd (Queen's), MEd (SUNY-Buffalo), PhD (Alta.)  
G.C.B. Eider, Dip. PE Adv. (St. Mary's, London), MEd (Georgia Southern), PhD (McM)  
R.F. Lyons, BA (Dal), MEd (Xavier), PhD (Oregon)  
T.L. Maloney, BPE, BEd (Alta.), MA (W.Ont), PhD (Alta.)  
J.F. McCabe, BPE, BA (UNB), MS, EdD (Tenn.)  
W.R. Mitic, BA (W Ont.), MHK (Windsor), EdD (SUNY-Buffalo), Graduate Coordinator of the Health Education Division  
C.A. Putnam, BPE (Man.), MS (Wash.), PhD (Iowa)  
P.D. Richards, Teach. Cert. (Trent Park Coll.), Laban Arts of Movement Centre Cert. (England), MA (Colorado).  
S.M. Shaw, Cert.Ed. (Inst. Ed, London), BPE, MSc (Dal), PhD (Carl.)  
J.F. Singleton, BA (Waterloo), MS (Penn.State), PhD (Maryland) Graduate Co-ordinator of the Leisure Studies Division  
L.J. Verabloff, BA, BPHE (Queen's), MS (Mich.), PhD (Ohio State)

### Assistant Professors

L.J. Barnes, BPE, MSc (Dal)  
N.M. Ipson, BA, MS (Brigham Young U.)  
D.P. McGuire, BA (Wright State), MA (Cincinnati), Head of the Health Education Division

The School of Recreation, Physical, and Health Education offers master's degree programmes in three areas: Master of Arts in Health Education, Master of Science in Kinesiology and Master of Arts in Leisure Studies. There are ongoing research programmes conducted in each of the areas of health education (basic health-related research and evaluation of school and community health education/health promotion policies, programmes, practices and content), kinesiology (exercise physiology, motor behaviour, biomechanics) and leisure studies (leisure and youth, women and the family, disabled persons, gerontology; sports history and sport sociology).

### Admission Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies.

Students seeking admissions to the MA programme in Health Education should have earned an excellent record during four years of undergraduate studies in health education, in an allied health profession or in a life or social science. Qualifying work may be required of applicants whose background for advanced studies in health education or health promotion is judged deficient.

### Programme Requirements

One full academic year (12 months) of resident study at Dalhousie University is a minimum requirement for the master's degrees. Completion of the degrees is also possible through part-time study.

Financial assistance is not available for students undertaking the degree on a part-time basis.

A thesis proposal must be approved by the candidate's thesis examination committee, which consists of at least three examiners, at least two of whom are members of the School's graduate faculty, before the thesis research may be undertaken. The candidate's advisor (i.e. research supervisor) is not a member of this committee, which also must approve the completed thesis before conferral of the Master's degree is recommended.

Five credits (30 credit hours) at the graduate level are required in all programmes. Required and elective classes for each programme are described below. Beyond the required classes, the classes are selected from the electives list for his/her programme. Each class is worth three (3) credit hours. In addition, graduate classes from other departments at Dalhousie University may be used to fulfill degree requirements. In certain instances undergraduate classes may count toward master's requirements.

### Ancillary Classes

Students may take a maximum of 6 credit

hours of ancillary courses, above and beyond the required programme of courses.

### Master of Arts Degree Health Education

The MA (Health Education) degree programme requires a minimum of 30 credit hours - 18 credit hours of classes and 12 credit hours of thesis work. Students must complete courses in research methods, statistics, measurement & evaluation and health education. The thesis topic will be determined by the student and academic advisor. When applicable, students may transfer as many as nine credit hours of graduate classes from another university. On completion of all work, a final oral examination covering the nature and findings of the thesis is required. Ordinarily, the degree must be completed within five years of first registration.

Although the MA (Health Education) degree programme officially has a one-year residency requirement, students should expect to take from 18 to 24 months of full-time work to complete it.

#### Required Classes: 24 credit hours

HRFD 9000R Thesis: 12 credit hours

Educ 5811A Quantitative Research Methods

or

LST 5501B Advanced Social Research Methods

HRFD 5503A Intermediate Statistics for the Health Sciences

or

EDUC 625B Intermediate Statistics & Research Design (Mount St. Vincent University)

Prerequisite: Before entering either LST 5501 or EDUC 625 students must have completed an introductory course in statistics with at least a "B" grade.

HRFD 5595B Measurement & Evaluation in Health Education and Health Promotion

HRFD 5514A Trends in Health Education

or

HRFD 5516B Theoretical & Scientific Bases of Health Education

#### Elective classes: 6 credit hours

HRFD 5600-5699 Independent Studies: Staff.

Class numbers and titles are assigned by the School - open to independent completion of study. Interested students should consult the Graduate Coordinator of the Health Education Division.

Students are encouraged to elect courses outside the Health Education Division that may help in the development of their research and/or professional interests, as well as courses within the Division. Electives must be approved by the student's advisor.

The Health Education Division holds research-oriented seminars during the Fall and

Spring semesters. The Division's Master's students are required to have attended at least 10 of these seminars, and to have presented at least one, before they schedule their thesis examination.

## Master of Science Degree

### Kinesiology

#### Required Classes

**KIN 5501 Research Methods for Natural Sciences:** L.E. Holt, 3 credit hours

**KIN 9000R Thesis:** 12 credit hours

Total: 15 credit hours

#### Elective Classes

**KIN 5503 Interdisciplinary Statistics for Health Sciences:** staff

**KIN 5510 Cardiopulmonary Dynamics in Exercise:** P.D. Campagna

**KIN 5511 Regulation of Substrate Metabolism in Muscle:** A. Bonen

**KIN 5516 Neuromuscular Physiology:** G.C.B. Elder

**KIN 5520 Advanced Anatomy and Kinesiology:** L.E. Holt

**KIN 5523 Biomechanics of Human Motion:** C.A. Putnam

**KIN 5524 Research Techniques in Biomechanics:** C.A. Putnam

**KIN 5530 Motor Learning and Performance:** J.F. McCabe

**KIN 5572 Topics in Human Performance:** J.F. McCabe

**KIN 5580 Principles of Skill Acquisition:** L.J. Verabloff

**KIN 5600-5699 Independent Studies:** staff, Class numbers and titles assigned by School - open to independent completion of study. Interested students should consult with the Graduate Coordinator of Kinesiology.

Students from undergraduate programmes other than Kinesiology, such as Biology, Psychology, Mathematics, and Physics, may also be considered for the MSc programme in Kinesiology.

The Kinesiology Division conducts weekly research-oriented seminars during the academic year. Graduate students are expected to attend as part of their programme of studies.

## Master of Arts Degree Leisure Studies

### Required Classes

**LST 5501 Advanced Social Research Methods:** S.M. Shaw, 3 credit hours

**LST 5503 Interdisciplinary Statistics for Health Sciences:** staff, 3 credit hours

or

another intermediate statistics class approved by the Leisure Studies Graduate Co-ordinator.

**LST 5592 Interdisciplinary Basis of Leisure Science:** Staff, 3 credit hours

**LST 9000R Thesis:** 12 credit hours

Total: 21 credit hours

### Elective Classes

**LST 5512 Lifestyles of Ill and Disabled Persons:** R.F. Lyons

**LST 5550 Historical Analysis of Sport and Culture:** A.J. Young.

**LST 5560 Sociological and Cross Cultural Perspectives on Sport:** Staff.

**LST 5561 Gender, Leisure and the Family:** S.M. Shaw.

**LST 5562 New Perspectives on Youth:** A. Richards.

**LST 5563 Leisure Behaviour in Older Adults:** J.F. Singleton.

**LST 5600-5699 Independent Studies:** staff. Class numbers and titles assigned by School - open to independent completion of study. Interested students should consult with the Graduate Coordinator of the Leisure Studies Division.

The Leisure Studies Division conducts weekly research-oriented seminars during the academic year. Graduate students are expected to attend as part of their programme of studies.

## Social Work

**Location:** 6414 Coburg Road  
Halifax, N.S. B3H 3J5  
**Telephone:** (902) 494-3760

**Director of School**  
J. Gilroy

### Professors

R.W. Carlson, BA, MSW (Penn.), PhD (Chic.)  
J.E. Cummings, BA(Dal), MSW(StFX), DSW(Tor)  
D.P. Kerans, BA (Loyola), MA (St. Louis), STL  
(Innsbruck), DRS (Strasbourg)  
F.C. Wien, BA (Qu.), MA, PhD (Cornell)

### Associate Professors

M.L. Courtney, BA (Dal), MSW (SMU)  
G. Fitzgerald, BA (Dal), MSW (King's)  
J. Gilroy, BA (Dal), MSW (King's), MA (Tor.)  
D. Moore, Dip. Soc. Stud. (Lond.), BA, MA  
(Dal), PhD (Boston U)  
R. O'Day, BA (UBC), MA, PhD (Mich.)  
D. Williams, AB(Chic),MSW(Cal), PhD(Brandeis)  
R. Williams, BA (Acad), MA (Tor), Ed.D. (OISE)

### Assistant Professors

W. Bernard, NA (MSVU), MSW (Dal)  
M. Deveau, BA (Ste. Anne), MSW (Dal),  
Resident Faculty Member, Church Point  
J.B. Duplisa, BA, MSW (Mt. A)  
J. Harbison, BA, BSS (Dublin), Grad. Dip. SW  
(Edinburgh), Doc. Cand. (Tor.)  
B.K. Richard, BA (Mt. A), MSW (Dal)  
A. Sexton, BA (St. Thomas), MSW (Dal)  
E. Whitmore, BA, MA (Boston), PhD (Cornell)

### Field Instructors

Paul Avery  
Peggy Beaton  
Susan Bennett  
Mona Bordage  
Jane Cobden  
Barbara Comeau  
Deborah Dalzell  
Sharon Gibson  
Carolyn Humphreys  
Hayden Laltoo  
Anne Marie Maloney  
Verle Marchand  
Aureida Michaud-Achorn  
Marie Sutherland  
Gail Warriner  
Peggy White  
Tana Woodward

### Master of Social Work (MSW)

The one year MSW programme is intended to advance knowledge about the resolution of social problems in Canada and in the Maritime

region, and especially to aid in increasing the effectiveness of regional social services. It is intended to offer to professional social workers, and to other persons with a good background for social work, an opportunity to study in depth subject matter of interest to the student, within one of two specializations.

Specialization topics are community practice, and individual and family practice. The latter is subdivided into concentrations dealing with family and child welfare on the one hand, and social work in physical and mental health settings on the other.

### Admission Requirements

Candidates must hold a Bachelor of Social Work degree from a university of recognized standing, or the equivalent. Candidates with some background in social work learning who do not possess a BSW degree may in exceptional circumstance, be admitted to a 2 year programme or to a qualifying year, depending on qualifications. Students registered in a qualifying year must reapply for admission. Relevant work experience is an important consideration for admission to both specializations. Applicants should show evidence of personal maturity and suitability for social work.

Applicants must demonstrate a sound plan of study. The plan will indicate the specialization chosen, interests in related areas, and a preference for a specific Master's project or thesis. The deadline for receiving applications (including study proposal and supporting documents) to the programme is March 1st.

The Maritime School offers affirmative treatment for indigenous minorities - Aboriginal, Acadian and Black - of the Atlantic Region.

Further information may be obtained from the Coordinator of Graduate Programme, Maritime School of Social Work of Dalhousie Univ, 6414 Coburg Road, Halifax, N.S., B3H 3J5.

The programme can be taken in the form of one academic year of full time study or three academic years of part time study.

### The Programmes

**Individual and Family Practice  
Specialization: Required Courses**  
MSW 6335R Theory and Methods of  
Intervention: 1 credit

MSW 6340R Social Work in Family and Child  
Welfare: 1½ credits, for students of this  
concentration

or  
MSW 6345R Social Work in Physical and Mental  
Health: 1½ credits, for students in this  
concentration

**MSW 6020R Master's Project in Individual and Family Practice:** 1 credit, open to independent completion of study

or

**MSW 6030R Thesis in Individual and Family Practice:** 1½ credits, open to independent completion of study

**Community Practice: Required Courses**

**MSW 6360R The Theory and Practice of Community Work:** 1 1/2 credits

**MSW 6220R Master's Project in Community Practice:** 1 credit, open to independent completion of study

or

**MSW 6230R Thesis in Community Practice:** 1½ credits, open to independent completion of study

**MSW 6380A The Social Policy Context of Community Work**

**MSW 6385B Community and Social Change Analysis**

**Electives**

in addition to the 3½ credits specified above for each specialization, each student is required to complete 1½ credits of electives. At least one half-credit elective must be taken outside the School of Social Work. The School currently offers three electives:

**MSW 6365A/B Community Socio-Economic Devel.**

**MSW 6370A/B Advanced Practice Skills**

**MSW 6375A/B Group Dynamics**

**Other**

Students are also required to take a non-credit course dealing with contemporary issues in social work. This is:

**MSW 5990 Colloquium: (Non-credit)**

Students should note that the MSW programme includes a field experience component in appropriate agencies for 400 hours.

**Required withdrawal from the Master of Social Work Programme**

The M.S.S.W. acting through its Programme Committee and its Director may require a student to withdraw if judged to be unsuitable in aptitude and fitness for the profession of Social Work. Because of the nature of the study and practice of Social Work, which places clients in a position of special trust in relation to social workers and social work, certain impairments or some types of conduct unbecoming to a member of the social work profession may be grounds for dismissal, or

suspension. Aptitude and fitness for the profession of Social Work, as determined by the M.S.W. Programme Committee, are requirements for continuation in the programme.

The following list of examples illustrates the criteria used to assess the unsuitability in aptitude and fitness. This list should not be considered to exclude other such behaviours:

- (i) conviction for criminal activity (e.g. assault, sexual assault, fraud and drug trafficking);
- (ii) persistent substance abuse (e.g. alcoholism, drug addiction, use of illegal drugs);
- (iii) any medical condition which affects an individual's ability to perform as a social worker if that condition is chronic and/or recurring and affects judgement;
- (iv) unethical behaviour (see C.A.S.W. Code of Ethics, 1983).

The Committee will consider the student's situation in confidence and shall determine whether the student is fit for the study and practice of Social Work. The principles of natural justice and due process will be observed in all Committee deliberations.



## Sociology and Social Anthropology

Location: A&A Building  
Halifax, N.S. B3H 1T2  
Telephone: (902) 494-6593

**Chairperson of Department**  
Richard Apostle

### Professors

R. Apostle, BA (Simon Fraser), MA, PhD (U of Calif. Berkeley)  
J.H. Barkow, AB (Brooklyn), AM, PhD (Chic.)  
D.H. Clairmont, BA, MA (McM), PhD (Wash. U) (Graduate Coordinator)  
H.V. Gamberg, BA (Brandeis), AM, PhD (Princ.)  
R.C. Kall, BA (Dal), BD, MA (Tor.), PhD (McG)  
L. Kasdan, MA, PhD (Chic.)  
J.J. Mangalam, PhD (Cornell)

### Associate Professors

M. Binkley, BA, MA, PhD (Tor.), Associate Dean, Faculty of Arts and Social Sciences  
P.M. Butler, BA, MA, PhD (U of Tor.)  
D.H. Elliott, BA (Yale), PhD (Pitt.)  
J.L. Elliott, BA (Wells), MA (Kan.), PhD (Pitt.)  
N.W. Jabbara, BA (U of Calif.-Santa Barbara), MA (Indiana), PhD (Catholic) (Leave of Absence)  
V.P. Miller, BA (U. of Calif.-Berkeley), MA, PhD (U of Calif.-Davis)  
J.G. Morgan, BA (Nott.), MA (McM), DPhil (Oxon.)  
C. Murphy, BA (St.FX), MA (Dal), PhD (Tor.)  
J.D. Stolzman, BA (Ore.), MS (Fla.), PhD (Ore.)  
V. Thiesen, BA (Man.), MA, PhD (Wis.)

### Assistant Professors

P.G. Clark, BA, MA (McM), PhD (UBC)  
S. Pollock, BN (Manitoba), BA, PhD (Warwick)

### Research Associates

J. Benoit, BA, MA (Univ. of Guelph), PhD (Johns Hopkins)  
B. Keddy, BScN (MSVU), MA, PhD (Dal)  
B. Raymond, MA (U Cal.-Berkeley), PhD (Chic.)  
S. Shaw, BPE, MSc (Dal), PhD (Carleton)

### Canada Research Fellow

T. Li, BA, PhD (Cambridge)

### SSHRC Post-Doctoral Fellow

P. Barber, BA, MA (Auckland), PhD (Tor)

The Department of Sociology and Social Anthropology offers a programme of both full-time and part-time study leading to the degree of Master of Arts in Sociology.

## Admission Requirements

All candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. Candidates will normally be expected to hold a four-year degree in sociology with at least an upper second class (B<sup>+</sup>) standing. It is expected that a candidate's undergraduate work will have included classes in sociological theory, research methods, and statistics. Promising applicants who fail to meet these requirements may be admitted to a qualifying year which, if successfully completed, would permit subsequent enrolment in the MA programme.

## MA Degree Programme

For the minimum time required to complete this programme, see Section 6. The full time programme is normally of one year's duration. Part time students are expected to complete all requirements within five years of their initial enrolment in the programme.

The normal programme is made up of five full-year credits. A thesis, worth two credits, is required as are the following classes: Sociology 5050A (½ credit); Sociology 5060B (½ credit); and Sociology 5200 (one credit). An elective class approved by the Graduate Education Committee constitutes the final credit.

An examination in the student's chosen area of specialization as well as defence of a thesis proposal are required.

## Classes Offered

Classes other than those listed may be offered. Please consult Department for further information.

SSA 5050A/B Advanced Theory

SSA 5060A/B Advanced Methods

SSA 5200 Graduate Seminar

SSA 5510A/B Graduate Readings in Sociology

SSA 5520A/B Graduate Readings in Sociology

SSA 5561A/B Gender, Leisure and the Family

SSA 9000 MA Thesis

# 1991

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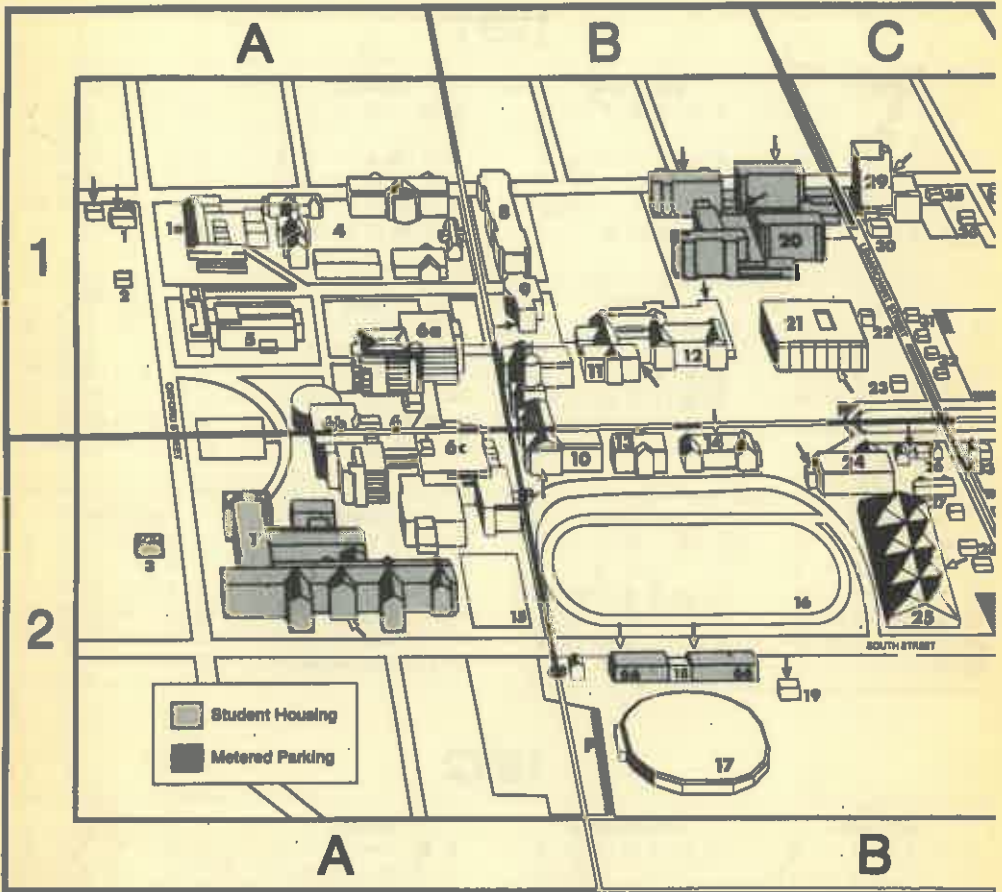
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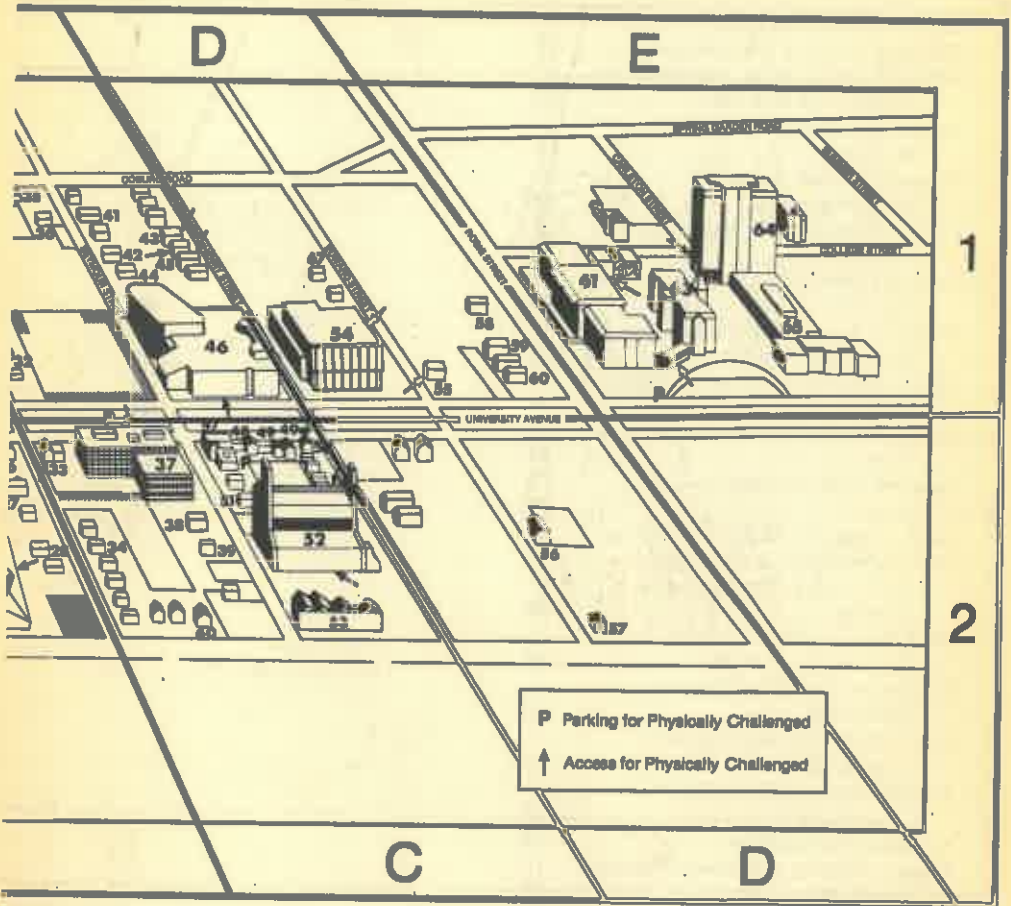
  

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- Admissions — 10 (B1, B2)
- Alumni Office — 18 (B2)
- Arts and Administration Building — 10 (B1, B2)
- Arts Centre — 48 (C1)
- Biology — 8a (A1)
- Bookstore — 37 (C2)
- Burbridge Building — 62 (E1)
- Business Administration, School of — 29 (C1)
- Canadian Studies — 36 (C1)
- Central Services Building — 52 (C2)
- Chase Building — 9 (B1)
- Chemistry — 11, 12 (B1)
- Classics — 27 (B2)
- Comparative Religion — 23 (B1)
- Computer Centre — 21 (B1)
- Counselling and Psychological Services — 37 (C2)
- Dalplex — 17 (B2)
- Day Care — 1a (A1)
- Dentistry and Dental Hygiene — 61 (E1)
- Development Office — 35 (C1)
- Dunn Building — 8 (B1)
- Economics — 26 (B2)
- Education — 14 (B2)
- Engineering — 8 (B1)
- Eliza Ritchie Hall — 66 (B2)

- English — 42, 43 (C1)
- Forrest Building — 63 (E1)
- French — 23 (B1), 32 (C1)
- Geology — 8b (A1, A2)
- German — 31 (C1)
- Graduate House — 33 (C2)
- Henson College — 47, 48, 50, 51 (C2)
- History — 41 (C1)
- Housing Office — 37 (C2)
- Howe Hall — 20 (B1)
- International Development Studies — 36 (C1)
- International Student Centre — 67 (D1)
- Killam Library — 21 (B1)
- King's College — 4 (A1)
- Law Building — 64 (D1)
- Life Sciences Centre — 6a, b, c (A1, A2)
- Macdonald Building — 11 (B1)
- Mathematics, Statistics, Computing Science — 9 (B1)
- Medicine — 64 (E1)
- Multidisciplinary Centre — 36 (C1)
- Nursing, School of — 63 (E1)
- Occupational Therapy, School of — 63 (E1)
- Oceanography — 8b (A1, A2)
- Part-time Studies and Extension — 48 (C2)
- Pharmacy, College of — 62 (E1)



- Philosophy — 45 (C1)
- Physics — 8 (B1)
- Physiotherapy, School of — 63 (E1)
- Political Science — 10 (B1, B2)
- President's Leadership Class — 68 (B2)
- Psychology — 6c (A2)
- Public Administration, School of — 34 (C2)
- Public Relations — 21 (B1)
- Registrar's Office — 10 (B1, B2)
- Recreation, Physical and Health Education,  
School of — 19 (B2)
- Resource and Environmental Studies — 60 (D1)
- Rink — 25 (B2)
- Russian — 22 (B1)
- Security and Traffic — 40 (C2)
- Shirreff Hall — 7 (A2)
- Social Work — 1 (A1)
- Sociology and Social Anthropology — 53 (C2)
- Spanish — 22 (B1)
- Student Union Building — 37 (C2)
- Studley Gymnasium — 24 (B2)
- Theatre — 46 (C1)
- Transition Year Program — 30 (C1)
- Tupper Building — 64 (E1)
- University Health Services — 20 (B1)
- Women's Studies — 36 (C1)

For specific locations of offices and departments, consult the university switchboard, 494-2211, the Halifax-Dartmouth telephone directory, or the Dalhousie telephone directory.

January 1991

**Index of Awards and Scholarships**

Bennet Memorial Scholarship, C. L. .... 45  
Dalhousie Graduate Scholarships ..... 43  
Dept of External Affairs Fellowships in  
International Business ..... 44  
Godsoe Scholarship, Gerald and  
Margaret ..... 45  
Goldberg-Schulich Award for  
Entrepreneurship ..... 44  
Goudge Scholarship in Psychology, Dr.  
Mabel E. .... 46  
Graham Commonwealth Bursary, John  
and Lina ..... 46  
Hayes International Scholarship,  
Professor F. Ronald ..... 45  
Killam Memorial Scholarships, Izaak  
Walton ..... 43  
Killam Postdoctoral Fellowships, Izaak  
Walton ..... 44  
Laba Memorial Research Award,  
John P. .... 45  
Leiper Memorial Scholarship, William ... 45  
MacGregor Memorial Teaching  
Fellowship in Physics, James  
Gordon ..... 45  
MacKenzie Teaching Fellowship in  
Physics, Dr. A. Stanley ..... 46  
Novopharm Pharmacy Research  
Fellowship ..... 45  
Parke, Davis Pharmacy Research  
Fellowship ..... 45  
Ritchie Doctoral Scholarship for  
Women, Eliza ..... 46  
Scotiabank Scholarships ..... 44  
Tupper Graduate Fellowship in English,  
James W. .... 45  
Wilson Scholarship, H. W. .... 45

General Index

Academic Costume .....	35	Financial Assistance .....	43
Academic Programmes .....	10	French .....	80
Admission Information .....	4	Geology .....	83
Admission Requirements .....	36	German .....	84
Doctoral Degree Programme .....	36	Health Services .....	18
English Language Competency .....	36	Health Services Administration .....	85
Master's Degree Programme .....	36	History .....	88
Anatomy .....	48	Housing/Residence Services .....	15
Appeals .....	43	Human Communication Disorders .....	90
Application .....	36	Identification Cards .....	24, 39
Biochemistry .....	49	Index of Awards and Scholarships .....	140
Biology .....	51	Instructional Development and	
Board of Governors .....	9	Technology .....	18
Bookstore .....	13	Interdisciplinary Studies .....	46
Business Administration .....	56	African Studies .....	46
Calendar .....	137	Neuroscience .....	46
Campus map .....	138	Resource and Environmental	
Chemistry .....	62	Studies .....	46
Classes .....	40	Interdisciplinary Studies Programme .....	92
A/B classes .....	40	International Student Centre .....	18
Ancillary .....	40	Joint Programmes .....	46
Audits .....	40	MBA/LLB .....	46
Full Year .....	40	MD/PhD .....	47
Summer classes .....	40	MPA/LLB .....	47
Classics .....	64	Laboratories .....	18
Clubs and Organizations .....	20	Law .....	93
Comprehensive Examinations .....	41	Libraries .....	19
Computing and Information Services .....	14	Library and Information Studies .....	97
Computing, Guide to Responsible .....	32	Manuscript Preparation .....	43
Conferring of Degrees .....	35	Marine Affairs .....	100
Dalhousie University .....	8	Mathematics, Statistics and Computing	
Definitions .....	7	Science .....	101
Degree Requirements .....	39	Microbiology .....	103
MA and MSc Degrees .....	39	Neuroscience .....	105
PhD Degree .....	40	Nursing .....	106
Departmental Listings .....	47	Oceanography .....	107
Economics .....	66	Oral and Maxillofacial Surgery .....	109
Education .....	70	Pass Standard .....	40
English .....	75	Pathology .....	110
Environmental Studies .....	77	Pharmacology .....	112
Examination Regulations .....	31	Pharmacy .....	113
Examination, Oral (PhD) .....	41	Philosophy .....	116
Examination, Preliminary PhD .....	41	Physics .....	118
Faculty of Graduate Studies .....	34	Physiology and Biophysics .....	121
Administrative Officers .....	34	Political Science .....	123
Fees .....	21	Psychology .....	125
Academic Fees .....	21	Public Administration .....	128
Admission Deposit .....	21	Recreation, Physical and Health	
Audit Courses .....	22	Education .....	131
Bursaries and Scholarships .....	23	Registration .....	21, 37
Canada Student Loans .....	23	Late Registration .....	22
Changes, Refunds and Withdrawals .....	22	Regulations .....	29
Dalplex .....	24	Discipline .....	30
Delinquent Accounts .....	23	Examination Regulations .....	31
Foreign Students .....	21	Faculty Regulations .....	35
General Regulations .....	21	General .....	29
Income Tax Credit .....	23	Intellectual Honesty .....	30
Laboratory Deposits .....	24	Release of Information .....	29
Payment .....	22	Residency Requirement .....	38
Student Union .....	24		
Fellowships .....	43		

<b>Resources and Services</b> .....	13
<b>Advisory Committee on Sexual Harassment</b> .....	13
<b>Advisor on Women</b> .....	13
<b>Alumni Association</b> .....	13
<b>Arts Centre</b> .....	15
<b>Athletics</b> .....	13
<b>Canada Employment Centre on Campus</b> .....	14
<b>Chaplaincy</b> .....	14
<b>Counselling and Psychological Services</b> .....	15
<b>Ombud's Office</b> .....	19
<b>Registrar's Office</b> .....	20
<b>Student Advocacy Service</b> .....	20
<b>Writing Workshop</b> .....	20
<b>Schedule of Academic Dates</b> .....	5
<b>Scholarships</b> .....	43
<b>Senate</b> .....	9
<b>Senate Discipline Committee</b> .....	32
<b>Social Work</b> .....	134
<b>Sociology and Social Anthropology</b> .....	136
<b>Special Institutes</b> .....	11
<b>Atlantic Institute of Biotechnology</b> ..	11
<b>Atlantic Institute of Criminology</b> ..	11
<b>Atlantic Region Magnetic Resonance Centre</b> .....	11
<b>Atlantic Research Centre for Mental Retardation</b> .....	11
<b>Centre for African Studies</b> .....	11
<b>Centre for Foreign Policy Studies</b> ..	11
<b>Centre for International Business Studies</b> .....	12
<b>Centre for Marine Geology</b> .....	12
<b>Dalhousie Health Law Institute</b> ..	12
<b>Lester Pearson Institute for International Development</b> .....	12
<b>Neuroscience Institute</b> .....	12
<b>Oceans Institute of Canada</b> .....	12
<b>Trace Analysis Research Centre</b> ..	13
<b>Student Accounts Office</b> .....	21
<b>Student Services</b> .....	20
<b>Student Union</b> .....	15
<b>Summer School</b> .....	39
<b>Teaching Assistantships</b> .....	46
<b>Theses</b> .....	41
<b>University Officers</b> .....	8
<b>Withdrawal From Classes</b> .....	41







**FOR FURTHER INFORMATION**

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Dalhousie University  
Halifax, N.S.  
Canada B3H 4H6  
Fax: 902-494-1630

or call:

902-494-2450

